

MODERN EDEN:

OR, THE

Gardener's Universal Guide:

CONTAINING

Plain and Familiar Instructions,

FOR

Performing every Branch of GARDENING,

Whether relating to Ornament or Utility.

In which are laid down the

Best Methods at large for raising all the Products

Of the KITCHEN and FLOWER-GARDEN,

AND

The Training, Pruning, and entire Management of

FRUIT-TREES.

The Whole founded on experience, according to the
Methods of the best GARDENERS of the present Time.
With many Useful and curious Experiments, which
have been repeatedly practised and proved, not only by
GARDENERS, but the VIRTUOSI in General.

BY

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AND

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L O N D O N :

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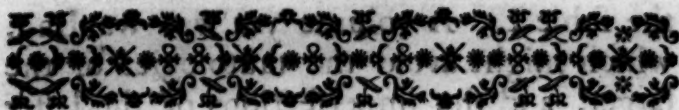
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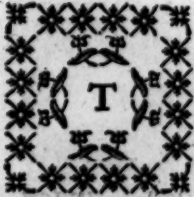
MODERN EDEN;

OR THE
Gardener's Universal Guide.



INTRODUCTION.

Containing the Plan and Purpose of the Work.

HE design of this book is to give all that is useful or curious in the Art of Gardening, in a moderate compass, free from vain repetitions, and founded on experience. Vast volumes have been written on it, which, at a great expence, contain in almost every page tedious repeatings of the same culture, under various names; and little tracts have been offered to the public, whose extent could not comprehend the full scope of

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the subject. A volume yet was wanting, which might avoid the tautologies of the larger, and the imperfections of the lesser works; and such a one it is we offer to the public. In this very art and article of culture will be given once at large, and each only once; and the methods laid down freely and candidly which have succeeded in a course of many years experience. We shall give the first place to use, the second only to curiosity: and shall therefore begin with the kitchen-garden, which, when well conducted, includes also the best of the fruit. Previous to the management of this part, it may be useful to lay down the proper disposition and construction of it; for these are essential articles, in which, if errors be committed at first, they are not easily remedied afterwards: therefore it requires timely care.

C H A P. I.

The proper Situation for a Kitchen-Garden.

THOUGH we give a great deal of artificial warmth to the kitchen-garden, the genial heat of the sun is of vast consequence: dung warms the earth at the roots; but this takes effect upon the air, in which all those out of absolute
hot

hot beds grow. As much as we are to open our kitchen-garden to the warm sun for this reason, with equal, or yet greater care are we to defend it from those quarters, whence nipping frosts and cold winds are expected to come. Therefore the spot of ground selected for this use, should be open to the south and south-west; and sheltered by somewhat distant buildings, or by plantations of tall trees to the north and east. Neither the trees nor the buildings should be so near, that they can cast a shade into the ground.

This is the proper situation; and there should lie a soil equally suitable. Nothing is so expensive as making ground, therefore this should be naturally good. It should be a rich loam, of a dusky hazel colour, and it must be full two spades deep: it will become yet deeper and richer by the improvements naturally made in it in a course of culture; but there should be this foundation. Beside the distant shelter just named, it should be walled all round; for no fence is so warm as this, or so secure or lasting. These walls will not only shelter the ground, but will be the place of the best wall-fruit: for the frequent digging and excellent condition of the earth within, will feed the fibres of the spreading roots of the fruit-trees,

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with an excellent nourishment; and the warmth of the air, and natural defence of the place, will save the blossoms from those spring-blasts, which are so common and so mischievous with us; and will forward the due ripening of the fruit.

Water and dung are the two next considerations. A shallow pond must be dug in a part of the ground near the center, that no bed may be too far from it, because of the labour of carriage. In large kitchen-gardens there should be two. The expence of digging these will be soon repaid by the saving in labour. Water must be constantly carried from the place where it is kept, to the plants that want it; the farther it is off, the more time is required to carry it, and the addition of time is an addition of expence; for in whatever way the master is served, every hour is to be paid for.

The pond should be full exposed to the sun, for that softens the water, and the softer it is the fitter for the purpose. Well-water will answer tolerably well for a kitchen-garden, if it be thus exposed in a shallow pond before it is used; but otherwise it is a great, though unseen, hurt to the generality of the products. Three days standing in this pond will soften the hardest water: if it be obliged
to

to be used sooner, it must be helped by wood-ashes: thus, if the pond were drained too near, and at once supplied from the spring or pump, and the water necessary to be used before it had stood the time mentioned, throw in two or three bushels of wood-ashes, and it may be used a day or more than a day sooner.

The kitchen-garden must be as near as possible to the stable, and must have a door directly opposite to that of the stable, that the dung may have as little a way as possible to be carried, for the same reason that has been given with regard to the water.

On the outside of the wall of the kitchen-garden, should be a spot for mixing up of composts; and the best aspect this can have is to the east. It should be inclosed within a hedge; and there mixtures may be made of dung, and pond-mud, and virgin-earth, which may lie their time to mellow unseen, before they are brought into use in the beds.

There must be also a ready way out of the kitchen-garden into this spot, that the labour of bringing the manure into the ground may be little; and the same passage will serve for wheeling out the rubbish of the garden, which, being thrown

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in heaps with proper mixture, will make also good compost for manure.

In that part of the kitchen-garden which is nearest of all to the stable, must be marked out a space for the hot beds; and this should be enclosed separately from the rest by a reed hedge, and always kept locked up. The rest of the space is for beds for the common products: and the ground being now enclosed, and the places of all the essential parts marked out, we may consider its proper disposition.

C H A P. II.

Of the Disposition of the Ground.

THIS is a subject on which the reader must be requested to regard his judgment, rather than those prejudices long custom has established; for certainly the common disposition of Gentlemens kitchen-gardens is essentially wrong.

We cannot give the products of this ground too much nourishment: therefore we should carefully give them all we can; that is, we must allow them all the advantages of culture, and give them the full benefit of it to themselves. It is common to plant espaliers in kitchen-gardens; but

but this prevents a perfect digging of the ground, and the trees exhaust it. The products of this garden were all originally of a wild nature, the roots small and woody, and the herbage dry, and harsh to the taste. Culture and abundant nourishment have filled and swelled these out, and made them mild: we sow the seeds of plants thus meliorated, and we should continue the same means to keep them in the same condition. We must allow them a good soil. This will be provided from the heaps of compost, the natural earth, and the old hot beds; and we must make the most of it by culture. Enthusiasts in agriculture have endeavoured to put culture, or breaking of the ground, in the place of dung; but they do best together: both are excellent, both tend to the same purpose, enriching the soil by dividing its parts, and both should be used.

The culture of the kitchen-ground is the work of the spade; and every thing should be clear for this. The fruit-garden should be a distinct spot from it: and no tree whatsoever should be allowed a place here, beside those at the walls: this will give free room for the implements of gardening, and there will be nothing except the extreme roots of the wall-trees, to draw the least nourishment from the proper crops. The

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ground will be thus enriched to the proper degree; and the plants allotted to it will have all the benefit.

There is another evident reason against espaliers; they limit us to the eternal use of the same spots of ground: whereas, in the plain course here directed, we may change more or less every year the parts that are in fallow and in culture. The kitchen-ground requires no grass or gravel walks: nothing here is to be for show, but all for use; yet this use requires, that there be certain walks or alleys. These must be broad enough, not only for the foot, but for the barrow: they will be of necessity very numerous, and consequently they occupy a certain and not inconsiderable share of the ground. These are the parts in fallow: they have not the advantage of those spots which are trenched, and turned up to the sun and air, but still they are at rest; and mould that is at rest always recruits itself for new productions. The treading upon these, and wheeling over them, presses and breaks the soil in a new manner, as heavy rolling breaks ground that has been harrowed; and when these alleys come after a year's rest to be turned up and well broke, they are very fertile.

Therefore

Therefore it should be the constant practice, to make the beds of the second year, where the walks or alleys were the former; and to carry the new alleys along the center of what was the beds. This will have more advantage than is thought: it is like having virgin-earth to work upon every year; for beside the space that was absolutely in the alley, the very edges of the beds on each side are not planted. This therefore extends the unoccupied space considerably; and, if the beds are but of moderate breadth, which is vastly the best way, it will amount to at least one third of the ground.

This we turn up fresh every year, break it by digging, and mellow it by additions from the heaps of compost; and in this we plant our intended products, allowing them all the nourishment, while that part which was in growth the year before, is now in fallow for the year succeeding.

C H A P. III.

Of the Form of the Beds.

THE preceding purpose will be greatly assisted by the proper disposition and form of the beds, which being now disencumbered from the restraint and load of fruit,

fruit, on the espaliers, we can lay out as shall be best for the crops. In kitchen-gardens planted with espaliers, the quarters are all square, or of some like form, for the sake of the walks between: but here we consider only the proper products.

That bed is most convenient, which can be easiest weeded and watered; and such a one must be long, and not too broad. The length must be determined from the ground; the breadth should be such as a man can conveniently reach half over, for he has the two sides, there being walks each way, and he may reach from either to the middle. This gives the breadth of a kitchen-garden border to be about five foot; and there is none better.

In the usual way of gardening, by which the quarters are enclosed in espaliers, the labourer is obliged to go round to some opening before he can get in to water, or get out with the rubbish; and this is so much loss of time. The ground is also kept from the free air, to which all fruit and herbage owe their perfect flavour. In the way here proposed, the passage may be short and plain to all the beds, and from them, either to one another, or back to the water, or to the place of composts.

To contrive this the most conveniently, let the pond be considered as the spot
from

from whence we are to set out every way; let the ground be all laid out in five foot beds, with alleys just wide enough for going conveniently in them; let all these alleys run strait like the rays of a star from the edges of the pond to the extent of the ground; that is, to the alley that runs every way just within the border that is made from the foot of the wall.

Thus there will be first a common border carried round all the wall, and an alley within that; and then, from that alley, several others, at five foot distances all the way, running strait to the verge of the pond. The heads of the five foot beds will also terminate at this surrounding alley: and this will be the whole disposition. Nothing can be more simple or easy: beauty is not consulted here; but, if it were, no disposition is preferable in that respect, and no other is or can be so convenient.

The pond will be in the center, round which there must be a trodden foot-way, and opposite every third alley a place for dipping for the water. There will be a strait way for the barrow up each alley; and it may return either down the same, or the next, according to the watering that is required. The beds will be narrowest at the pond; but five foot should be their breadth in the midway
between

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between that part and the head; and they must be allowed to swell out proportionably at the head-end, that no ground may be lost. The bed may be both weeded and watered from the head, as well as from the sides; and this makes the additional breadth there of little inconvenience. In very large grounds, the encrease and diminution in breadth from the middle to the head, and to the pond, would be considerable; but as in such places there should be two or more ponds, these are to be so many centers from which the alleys are to run.

There is no disposition in which the ground of a kitchen-garden will turn to more account than this, none in which it may be so easily and conveniently managed. Constantly, as the crops in the beds are cleared off, the alleys between them should be dug up for beds, and the alley for the succeeding year carried along the center of the former bed. The aspect of the ground would be then always the same, yet it would be in a continual rotation of production and of fallow; and, by what I have seen in my own ground, the produce will be considerably larger than in the common way, every thing better, and the management cheaper by about twenty per cent.

C H A P.

C H A P. IV.

Of the Seed-Room, and Gardener's Lodging-Room.

THERE will want nothing to complete this kitchen-garden, but an apartment for the gardener, and the conveniences of keeping his tools dry, and his roots and seeds secure from damp and vermin. A very slight structure will do for this; or any old building that is upon the spot may be used for the purpose. If the gardener's bed-room be upon the upper floor, all the rest may be managed below with little expence or trouble. For the tools, any odd corners of the place will do; and for the seeds and roots there should be two divisions, the one for drying, and the other for preserving of them. What is required in both these cases, is the same, namely, a free air, and no sun; for this will equally well dry them, and preserve them. They are to be dried according to their kinds, on the floor, or on a mat or hair-cloth; and one of the two divisions should be kept only for this purpose, requiring no other furniture. In the other there should be shelves along the walls, and lines across

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the cieling. The roots, which are to be kept dry, should be laid on the shelves, and the seeds hung to dry in paper-bags to the lines at the cieling. The same place must not be used for drying and keeping; for, in that case, the damp, rising from succeeding parcels, as they dry, would damage the first.

It is always best for the gardener to have his lodging on the spot, if that can be done with any convenience; for small accidents, if not seen and remedied in time, often bring on great mischief.

C H A P. V.

Of the proper Mould for a Kitchen-Garden.

THE food and nourishment of plants is earth, dissolved in water: the greater the quantity of this therefore that is dissolved, the better the produce will be supported. On this depends the choice for the soil of a kitchen-garden; which should be originally good, because it is then capable of most improvement.

Earths are of various kinds; and these, in proportion, as they are more or less capable of being dissolved in water, are richer or poorer for the service of plants. Clay, in its natural state, is very little capable

capable of dissolution, black mould the most of all earths, and sand not at all: therefore pure black mould is the best of all soils for this purpose. The garden-ground, at the Neat houses beyond Millbank, is of this kind; and it lets yearly for twelve pounds an acre: yet those who hire it, live as well as such as give but two or three. This is a soil scarce any where to be found pure, except near the banks of rivers; but there is more or less of it in the composition of other kinds: and in general, they are better or worse in proportion as they have it in greater or lesser quantity. The soils in which it is most abundant, are the darkest of the hazel moulds. These are to be preferred therefore; and we have shewn why clayey and sandy ground should be rejected.

It is necessary this soil should have the full depth we have named of two spades; and we must consult also the bottom or bed that lies close under it: this should be a good and tolerably firm loam. If a bed of clay lay under it, that would detain the water, which would lie chill about the roots; and the plants, after a fine first shoot, would come to little. On the other hand, if a bed of loose gravel, or open sand, lay under it, the water would drain away too quick, for doing them full service:

vice: a hard bed of gravel, that lies compact like a rock, as we have it in several parts of England, is very well: and when clay has so much sand or coarse earth among it as to approach to a loamy nature, it will do; for in either of these cases the water that is given the beds will neither be detained too long, nor will it run off too hastily.

A proper soil being found, with one or other of these good bottoms, if it be virgin-earth as yet under its own turf, its natural fertility will answer very finely the first year; but we must have our composts ready for its improvement afterwards.

When fresh ground is to be made into a garden, the whole piece must be dug up two spades deep, and the turf turned wrong-side upwards at the bottom; then the best of the mould being kept at the surface, the common kitchen-garden products will thrive excellently upon it; and, while they are growing, the turf being laid too deep to grow, will rot, and so become a very fine manure. This will go a great way toward improving the ground for the succeeding year; and, as the beds will then be dug where the walks are for the first year, there will be the advantage of rotted turf and virgin-earth together, for the second season. The next year

year after this, the beds will again be where the alleys are the second, that is, where the crops of the first year grew in the virgin mould; and this being now turned up, the turf which has lain two years will be perfectly mellowed into soil, and will give a great fertility to the whole.

In this manner a kitchen-garden may be wrought, if the owner pleases, three years without dung. The products of the ground will not be altogether so large as if that addition had been made; but they will be remarkably sweet and well-flavoured. We do not universally recommend that practice: those who are curious may use it; and all that is to be directed farther in regard of it, is very frequent and good digging. In the more usual way, dung is used from the beginning: and whether this be or be not right, depends upon the care in managing and employing it.

C H A P. VI.

Of the Use of Dung in a Kitchen-Garden.

GOOD earth will produce well-tasted kitchen-stuff without dung, but it will not be so large nor so abundant: the advantage rising from the use of dung, is
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the giving this plenty and large size to the productions; but they are apt to be rank. Good land will yield much the better for dung; and such as is indifferent will yield more with this help than the best will without it. Therefore we should attempt to gain the benefit without the mischief.

The rankness which dung gives, is greatest when it is new; it grows milder when it has had time to mellow. It is also more perceived when new dung is used alone, and much less when old dung is made into compost. This shews the great source of the mischief, and at the same time the remedy. The great fertility which rises from a use of dung, is a circumstance that must always recommend it in kitchen-gardens; and the mischief of it arising from its being fresh and used alone, we must employ it well-rotted, and in form of compost.

Such a mixture should be used at all times in this part of a garden, and even at the very beginning, though the earth be virgin; only less of it will be then required.

One kind of compost cannot suit all soils; but the preparation is alike in all of them. We have directed that a piece of ground should be enclosed on the outside of the wall, and near the door, for this purpose:

purpose. The method of making the compost should be this. Mark out a piece of ground big enough for the heap, and begin by digging out the mould, turf and all, one spade deep: then throw in as much old mellow and well-rotted dung as will make a bed a foot and half thick; upon this throw the mould that was dug out; cover this with such another quantity of the same dung as was used at first, and over this throw as much pond-mud: then lay on a foot thickness more of the dung, and upon this half as much coal-ashes. Cover this last with a foot thickness of dung, and then pour on several pails of water. Beat it down, and thus let it lie three months.

Then at a small distance, within the easy throw of a fork, open such another place as at first, laying aside the mould and turf. Ram down the bottom of this opening, and throw in two or three loads of earth dug up where an old faggot-pile has stood, or wherever there has lain rotting timber. The whole heap of compost is to be thrown from the place where it is into this, and care is to be taken to mix it as much as possible in the taking it up and throwing. At present the heap consists of various ingredients, laid in distinct beds over one another: this throwing

ing to a new place is to mix them. It is to be done partly by a three-prong'd fork, and partly by a broad shovel. The way is this: throw on two or three pails of water over night, and the next morning begin the work with a pitch-fork, throwing off a full depth of that instrument. There will remain some loose stuff: this is to be taken up with a shovel, and thrown up on the first; and then the pitch-fork is to be used again, observing always to take up a part of two beds together, never one entire. This will tend greatly to the mixing of them; and the proper casting of the loose matter, which is left from time to time, where it is wanted, will do the rest.

The gardener must go over the new heap as it rises, with a large watering-pot in his hand, and water it several times all over. This will help to mellow and mix the ingredients, and wash the virtue of one into another. There must never be so much water used as to swim in any part, or run off, but enough to moisten the mass. No way will answer but the watering-pot, because this delivers it equally and in small quantities. When the whole heap is thus made up in a new place, it will heat of itself; and the several ingredients will rot among one another,

ther, the warmth all the time keeping up lightness in the mass. Thus it should lie four months; and at the end of that time it must have another turning. This must be performed in the same manner as the last; and, after it has lain two months longer, it will be fit for service.

This management requires time; but the trouble is very little. It should be begun sufficiently before-hand, that it may be ready when wanted; and this is the great secret of the gardener's carrying on every thing with regularity.

This compost is fit for good common ground, or such a soil as we have directed to be chosen for the garden. But if it happen that such a one cannot be had, care must be taken to improve that there is, whatsoever it be, according to the nature of its fault.

This must be done by an addition of some one article to the compost, according to its kind: if the soil be tough and clayey, a considerable quantity of sand must be added to the rest; and, if it be loose and sandy, then some tough loam, and a large quantity of old cow-dung.

C H A P. VII.

Of the Way of using the Compost.

THOUGH a good soil, when fresh, will produce sweet crops without assistance; yet, for the sake of abundance, and certainty of good herbage, we direct the beginning at once with an addition of compost, whether the ground be new made into a garden, or whether it has been in use before.

Therefore a good quantity of this mixture being ready, and in order for use, first of all observe, where one part of the ground is higher than another, and favour this yet more in the making up. Then from the lowest places carry a small brick-drain or two under-ground, which may empty into the spot where the compost is made, for the wet will always run off from this ground very rich with the manures. Thus there will be provision for those crops which require drier, and those which must have a damper soil; and yet in no part will there be a stagnation of water at the roots, for that no garden-produce will bear.

This care being taken in the disposition of the ground, dig up the whole two
spade

spade deep, and keep the finest mould for the top; then mark out the beds and alleys. Draw a roller over the alleys to make the difference the stronger; and let it lie open to the air three weeks. Then strew over the parts which are to make the beds a covering three inches deep of the compost, and immediately dig it in turning the ground at this time one spade's depth, and no more.

If it be fresh earth, a smaller quantity of compost will answer the first season. This must be doubled the second, and still more will be wanted the third. On the other hand, if it be poor exhausted ground, the greatest quantity must be laid on the first year, and less from time to time will do afterwards.

The ground is thus prepared for its first crops, and one care is needful for it always afterwards for the succeeding; this is, as soon as the useful part is gathered and cleared off, the haulm and refuse must be cleared away, and the ground immediately trenched, and thrown up in ridges, to sweeten for a new produce. A little of the compost should also be allowed, beside the yearly dressing, for every one of these crops.

Of the Disposition of the Produce.

IN the ground thus laid out, there will be some spots drier, and some moister, though none of either kind in the extreme; and the several products to be raised are to be so disposed as to take the advantage of this difference, those which love most moisture being allowed the lowest places. The walls should be twelve feet high, and built of good sound brick. I have seen where, under the design of saving, old bricks have been used; but the proprietor was always sorry for it: they soon fill with holes, which harbour vermin; they never keep upright, which is an essential article, and they will scarce hold the nails: therefore new materials are cheapest in the end. On the outside of these, where they join the garden, there should be a plantation of shrubs to hide them; and on their inside are to be disposed the fruit-trees. These must have a border for their roots to spread in. These borders should be equal in breadth to the height of the wall, that is, four yards. This ground is not lost, though it must be used with discretion, and only for some particular

particular products. They are bad gardeners who raise peas and beans upon these borders; which yet many are tempted to do, because of the shelter and good aspect. But small fallowing, lettuce, onions, and such other slight rooting kinds, may be raised from time to time upon the ground without damage. The heads of all the beds terminate at the alley which comes within these twelve feet borders, and the whole care is to select proper parts of these for the peculiar kinds of produce. It is not necessary that one bed should be sown entire with one kind; and often it is not convenient. The warmer and drier parts of the same bed should be for those crops which require such soil; the same of the others. This we shall explain at large, treating of the several kinds.

Every part of the ground must at all times be kept clear from weeds; and the place of the composts must be managed with the same care; for if the seeds of any get into that, they will not fail to rise in the ground.

Though we advise selecting the warmer spots for some kinds, and the damper for others; yet neither of these must be raised year after year upon the same spot; for in that case they always degenerate, and grow poor. There will always be more spots

spots than one dry, and the same of the damp: these must be marked for the change from time to time; and one of the crops suited to them must be changed for another; and this continually, that the same plant may never be raised twice together on the same piece of ground. The success will also be greater, if at every crop we change seeds with some good gardener at a distance. This will be easily done in any place, because the advantage will be mutual; and I have many years marked the difference between plants raised on the same ground, and with the same advantages, from seeds ripened there, and those obtained from another place, and it exceeds thought.

Finally, cleanliness is a main article in the kitchen-garden: beside the clearing away the refuse of the crops, which is too often neglected, there should be care taken to clear away every two or three days whatever leaves or other parts have happened to decay in the growth. We know the ill effect of suffering dead leaves to lie about a green-house, or to hang upon the plants; and the same, tho' in a less degree, is the consequence of leaving them about, either upon the ground, or hanging to the plants in a kitchen-garden. The green-house is closer,
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so the damage is greater there; but they infect the air wherever they are, and hurt the thriving plants. The cabbage has large leaves, and the lower of them often decay, and hang down, while the plant flourishes above. These soon rot; and, when they are decayed, there is not a more filthy stench.

These and the like are the cause of that ill smell people complain of in kitchen-gardens; and, what is offensive to the senses, will always prove hurtful to the plants. A little trouble will take them off; a quarter of an hour once in three days will be sufficient to clear the whole ground of them. They should be thrown upon the compost-heap, where they will be useful, and the air kept sweet in the ground.

Thus will a kitchen-garden be laid out in an easy way, and to great advantage. The making of hot beds, and the like articles, we shall give at large under the several heads which require them: and, having laid out our ground, shall now advance to the culture of our crops; beginning with the easiest.

C H A P. IX.

Of the Products, and their Management.

THE products of the kitchen-garden may be arranged under three general heads, roots, herbage, and fruits. The culture of the first kind in general is easiest; that of the second more difficult; and that of fruits, particularly the better sort, as melons and cucumbers, the most nice of all. The kitchen-products do not admit of rules of distinction free from many exceptions; but these may be received as general, and will lead the young practitioner gradually from one kind of culture to the others. The management of the roots is easiest, because simplest: they require only sowing, watering, and cleaning. The herbs advance a step higher; for they require, beside those articles, one, two or more transplantings; and the fruit of the kinds we have named demand the hot bed, which is a particular, nice, and not easy business.

As the simplest and plainest things are easiest understood and practised, and as they lead naturally to those which are harder, clearing the way so far as the common operations are concerned, it will
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be best to begin with the simplest even of these.

Roots are easier managed than herbage; and of these the easiest are those which remain the least time in the ground. We shall chuse for our first example the Radish; concerning which there is more to be said than perhaps the common gardener is aware. It is easy to bring this to more delicacy than it usually has; and the root really deserves that care, for it is not much that thus improves it.

C H A P. X.

The Culture of the common Radish.

THE radish may be produced almost at any season of the year; but it is best and most esteemed in spring: therefore we shall direct its culture at that period; and it may be repeated at any other season, only in warmer weather chusing a more shaded place, and giving more water.

The radishes for early spring should be sown the preceding autumn, in a part of the ground where they will be likely to meet with least damage during winter. For this purpose chuse a spot that is open to the sun, and sheltered from cold: let it be at the head of the beds that runs south

south from the pond. Dig this up very carefully in the middle of October, a full spade depth, but no more; the radishes will thrive the better for the bottom being somewhat harder: break all the lumps, and lay the surface perfectly level; chuse good seed of the short top'd purple radish. It must be smooth, clean, sweet, heavy, and deep-coloured. These are proofs that it has been well ripened, and carefully cured. Some prefer the scarlet radish: it is indeed now becoming a fashion; and those who chuse may sow it in the same manner; but it never has the firmness nor the spirit of the true purple kind. This was the original radish, and is the best: and the short top'd sort is the best of these; it does not run so much to leaf, and the root consequently is better.

When the bed has lain five or six days after the digging, rake up the surface light and loose, and a little before sunset scatter on the seeds. Sift over them, through a coarse sieve, a quarter of an inch depth of fine mould, and the next morning give a gentle watering. Repeat this once in three days, unless there comes rain.

When the plants are come up, and have two or three of the rough leaves, pull up the worst, so as to leave the others at five inches

inches distance. After this they will want nothing but weeding. This is best done with a hoe, and should be repeated as often as any weeds appear. A small strong hoe is best, and care should be taken always to pick the earth as deep as the hoe will conveniently go; which, beside destroying the weeds, will greatly help the plants. If the winter be very severe, and the spot any thing exposed to the cold quarters, a very light covering of pease haulm may be thrown over the bed during the worst days, or a reed-hedge placed so as to keep off the sharpest blasts. In this manner they will stand very well, and about the second week in March they will be fit for eating; they will have a full root, with a small head, and their true flavour. They will be firm, though perfectly tender, and will break, not bend, in the hand. These are the marks of excellence in the radish.

To eat them in perfection, they must be pulled about ten o'clock in the morning, and laid in a cool cellar till the time of dinner; for this way they keep their spirited taste, and that agreeable firmness: whereas, if they be taken out of the ground at noon, the sun will have exhausted, and rendered them poor and flimsy. The part of the bed out of which radishes

dishes are to be pulled at the hour here directed, should have a good watering the morning before, but no more after that they are till gathered.

A moderate quantity of seed only should be sown at this October sowing; not enough for the supply of the whole spring, but for the month of March. Those for April should be sown later; for this is a root which soon grows sticky, and good for nothing.

Therefore the first bed of radishes having been sown in October, the gardener should in the very same manner sow a second parcel in November, and a third about the middle of December: both these crops are to be managed exactly as we have directed for the former. The first of them will come fit for use in the beginning of April, and the latter will last from the end of April till the middle of May; longer than which none need trouble themselves about this kind of root. But those who chuse may sow them in the same manner still longer, selecting in that case the less warm parts of the ground.

There are white and black round rooted radishes, of which some are fond. These are all cultivated in the same manner as the common kind, only that they will not stand the winter. The round white radish

dish should be sown in April, and the black radishes at the end of June. These will require more watering, as the season of their growth is naturally dryer; and they will come to perfection in six or seven weeks, and continue till the end of summer.

Beside the service of the table, seed must be procured from the common radish with care for the next crop. The best way is to change with some other person who we know is careful: but we must have good seed ourselves, if we expect to get good for it. In the beginning of May make up a bed for the seed-radishes near where they grow; dig the ground a full spade and half deep, and lay it level. In the evening of a mild day, when there has been a little rain, draw lines along this new bed at a yard distance, and mark the places where the plants are to stand at two feet and a half space, along these lines, placing always one between two others, not all of them over-against one another.

When the places are marked, open holes at a dozen of them with a spade, going the full depth that the ground was dug, and laying the mould on one side: chuse a dozen of the finest radishes that are in the common bed. They must be strait, single, not divided in the root, and well-

D coloured.

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coloured. Plant one in each hole, throwing the mould lightly and carefully about them: when a dozen are planted, open as many more holes, and thus proceed as long as day-light lasts; reserving the rest of the work for the next evening. There is no other time at which they are safely to be removed; and only a few must be taken up together, that they may be but a little while out of the ground. As soon as each evening's plantation is over, give them a good watering; and thus proceed till as many are planted as will be necessary for a due quantity of seed. After this keep the ground clear between them, and they will take care of themselves. The seed is to be suffered to attain its full growth upon the ground, and that in the lower pods is to begin to harden; then the plants must be pulled up and laid to dry; the seed when hardened is to be thrashed out, and put up for use.

The seed of the same year always succeeds better than such as has been kept any time.

The gardeners who live by raising kitchen-products sow radishes among other crops; but this should never be done by those who raise them for their own table, for every plant and root will be better for having the full advantage of the ground.

Carrots

Carrots may be sown with the early radishes, and spinage with the latter: or, the radish-seed may be let in among larger growing plants; but all will be the worse for this; and every kind will come to its highest perfection when it has the full virtue of the ground where it is sown.

C H A P. XI.

Of Carrots.

THE carrot requires a deeper soil and longer time of growth than the radish; but the culture of both is otherwise so much alike, that he who understands the one will be at no loss about the other. The carrots for the supply of a family should be sown in proportioned quantities at different seasons, as the radish, because they are best when young and delicate. The ground must be dug full two spades deep; and the best part of the garden for them is that which is dryest.

Chuse out a small spot of such ground in the beginning of January, and dig it up very well, breaking all the clods: then rake the surface perfectly even, and mixing a little dry mould with the seeds, sow them in the evening of a calm day.

There are three or four kinds of carrots

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differing in colour; the orange colour, the yellow, the white, and the red: of these the orange carrot is the best; the yellow and the white are much inferior to it in quality; and the red carrot is very tender. Chuse therefore the seeds of the orange carrot, and take care that they be new, sound, and in perfection. Mix them well with some dry mould, by rubbing between the hands, and scatter them thin over the ground; then walk several times over the whole spot to tread the seeds into the ground; and after this rake it all lightly over: give a careful watering the next morning, and then leave all to nature. The plants will shoot; and, when they first appear, there should be a little more water given them; but it must be in a morning, for fear of frost coming upon it in the night and killing them. This is a general rule, that all summer waterings should be at night, and all winter waterings in a morning.

When the plants have got three inches high, pull up the weakest, and leave the rest at six inches distance: as soon as weeds appear, hoe the ground between the carrots; and from that time keep it perfectly clear from weeds. This may be done by hoeing the bed once in three weeks; and thus they are to stand while they are growing

growing to their proper size. Then it will be a very good way to pull half of them while young, by that means leaving the rest at a greater distance : they will grow to a larger size, and at a more advanced season will be as valuable in their kind as the others.

Six weeks after the first sowing, dig up up another spot of ground, and sow a second bed of carrots in the same manner : this will be toward the end of February ; and these must be in a warm spot, well sheltered as the first. In the middle of March sow a third parcel ; and at the latter end of the same month another. These two last may be sown in any part of the ground, not requiring the same degree of warmth and shelter as the others.

These are all to be managed exactly as the first, and they will come in a succession of time, and keep the table supplied. If carrots are sown a little after Midsummer, they will in favourable seasons come to a growth for use in the latter end of autumn ; but this is hazardous. Some also sow them in August to stand the winter, and some early in the spring ; but there is a great chance against their coming to good. The seasons before directed are vastly preferable.

The red carrot must be sown in April,

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pril, and will come to use early in autumn. It is very delicate, the seeds may be had from Aleppo; but it will seldom ripen any in England.

The seeds of the common carrot ripen very freely; nothing more being necessary than to leave some of the strongest plants standing in the early beds, and to save the seed as soon as it is thoroughly hardened.

C H A P. XII.

Of the Parsnep.

IN the management of a kitchen-garden, one thing naturally leads the way to another; and he who has seen the culture of carrots will need but short directions for this root. The parsnep requires a deep rich soil; it need not be so dry as the carrot requires. Fresh dung is always found hurtful to both; but in our management before directed no such thing ever comes into the garden.

The first week in March dig up a piece of one of the beds two spades deep, and break it well: level the surface, and in a mild damp evening sow the parsnep-seeds, scattering them thinly over the ground; tread them lightly in, and then rake the bed slightly over.

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When the plants are three inches high, thin them to a foot asunder, and clear away the weeds. Once in three weeks hoe the ground for the same purpose, till the plants are strong and in full leaf, and they will then suffer no weeds to grow among them. Toward the end of summer the leaves will fade and decay; soon after the parsneps should then be all dug up. They are a root for winter-service; and if they are laid up in sand at this season they will keep good many months.

The seeds of parsnep should be saved in the same manner as those of radishes. Some of the finest roots must be taken up, and planted in a sheltered place, at a yard distance one from another. The seeds are to stand upon these plants till well hardened; and then the heads of the plant are to be cut off, and spread upon a mat in the seed-room to dry: after which the seeds are to be shook off and put up dry.

These, like the radish, should always be sown the next spring, for they are very apt to get damage in keeping. Thus the parsnep gives less trouble than the carrot, because one season of sowing answers for the whole year. The roots are not good till the leaves fade at autumn; but they keep good in sand all winter.

C H A P. XIII.

Of the Turnep.

NO root rewards the gardener's care better than the turnep; for its excellence depends more than all others upon culture, and will be proportioned in goodness to the attention shewn it in its growth. If neglected, flies often destroy the crop while young; and if it escape that danger, it grows hard and sticky; but due care will preserve it in the first growth, and give sweetness and tenderness afterwards.

There should be three sowings of turneps for the supply of the table: the first in April; the second in June; and the last in the beginning of August. These require different management, and even a different part of the ground should be allotted to each. And with regard to the sowing of different kinds, the early Dutch turnep is the kind for spring; and the green topp'd turnep for the other seasons: this is sweeter than the common red topp'd kind; and with good care will not grow sticky.

Chuse the seed of each kind, heavy, smooth, glossy, and fresh. For the spring-sowing, dig up a piece of ground under the shelter of a warm wall, and break it well.

Steep

Steep the seed in the following liquor: Boil a good quantity of tobacco stalks in water till it is very strong of them; then stir into this some aloes, foot, and flour of brimstone. Put in the seeds, and let them lie eighteen hours; then draw off the liquor, and sow them with the ingredients.

The manner of sowing should be this: draw lines across the bed at one foot distance, and make a trench with a hoe along each line; then drop in the seeds along these trenches not too thick; draw the mould over the seeds, and give a gentle watering.

The next morning lay some foot over the whole length of each trench; and for the future water over that. If rain does not fall, they should be watered carefully every other day.

When the plants appear above ground, the watering must be continued at least once a day, and the plants will thus be kept in health. The ingredients used in steeping will give no taste to the roots; they only promote the first growth, and keep off the fly. When the rough leaves are come, the danger of this enemy is over. Soon after this thin the plants to ten inches distance; then hoe the ground between the rows from time to time, and also between the plants.

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The turneps will grow fast: in the end of May they will be fit to boil with the tops; and they are very sweet that way. In June they will be of a size to send up as usual to table, and they will continue good till the next crop comes in.

About the middle of June sow the second crop of turneps. These must be the green topp'd kind. Chuse for them the ends of two or three of the beds next the water, that the ground may be moist, and water at hand for them. Steep the seed, and sow it as the former; and take double care to keep them well watered. Clear these to a foot's distance in the rows, and hoe the ground once in three weeks during the whole time of their growth.

In the first trench in August sow another parcel of the same seed; but upon a somewhat dryer piece of the ground, and better sheltered: manage these in all respects as the others, and they will continue good many months. This last crop will be in danger of caterpillars; but they must be picked off as soon as they are seen; for if they be suffered to eat up the leaves, the root will come to nothing.

The finest of the plants of the June sowing should be reserved for seed; they must be planted out into a dry warm part of the garden, at a yard distance, and kept

kept clean till they get into flower; after which they may be left to themselves: only, to prevent destruction by birds, some lime-twigs should be laid upon them when the seed begins to ripen. Some seed of the early sowing should be saved in the same manner; and both exchanged for the seed of equal goodness from another garden. The whole management of plants removed for seed we have given under the article radish.

C H A P. XIV.

Of Potatoes.

THE potatoe propagates itself so fast by root, that we need not regard its seeds. If the roots be planted in spring they will encrease ten-fold by autumn; and this is all the care that need be taken of them.

Chuse a dry part of the kitchen-ground; in the middle of March dig it very carefully up, and break the clods; then open trenches across the whole spot at two foot and a half distance from one another: they should be opened with the spade, and be made three quarters of the spade deep. Chuse a parcel of the finest and largest potatoes you can get. Plant them whole in
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these trenches, one at every two foot, then cover in the mould; they will need no watering. It is a custom to plant small roots, or pieces of roots, with a good eye in each; but the potatoes will go as far being planted whole at these distances, for every eye will shoot, and there will be room for them: and this way there is no danger of that rot which often happens when the eyes are planted. The largest are to be chosen, because they produce the largest in return.

From the time they are planted, they require no more care than clearing the ground from weeds, and that only at first; for when their own stalks are got to a height, no weed can grow among them.

About the middle of September, the potatoes may begin to be taken up; and when the frost comes, and the stalks wither, it is best to take up the whole remainder. They will keep good till the time of planting again, and supply the table all winter. The best way of preserving them, is to lay them up in heaps, with a considerable quantity of dry and light mould between them.

C H A P. XV.

Of Onions.

THE onion kind, including all the species and varieties, is very extensive; and scarce any kitchen-product is more generally useful. We shall treat first of the common onion. This is distinguished from the rest by its large root and hollow leaves. The common, the Spanish, and the Ægyptian onion, are all one kind. The warmer countries give the roots a greater mellowness and perfection; but the seeds sown here soon degenerate into the common or Strasburg onion; which is that used in all our kitchens.

In the beginning of March dig up a piece of the ground in a dry part, and break the mould perfectly well; lay the surface level with a rake, and thus let it lie three days. Then in a calm evening sprinkle on the seeds moderately thick: sift over them a quarter of an inch of mould, and after two days give the whole spot a gentle watering. When the crop has been three weeks above the ground, hoe it carefully; a small hoe is best; and the onions should be thinned to about six inches distance every way. After this give them a gentle watering. Once in three weeks repeat

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peat the hoeing, to keep the ground perfectly clean; and thus let them take their growth. In the latter end of July the roots will be considerably large; and what farther weeding is required must be done by hand; for the hoe would damage them. Three weeks more will bring the root to perfection, and then the leaves will decay. The roots are then to be taken up. Lay them upon the two next alleys to harden, and turn them every day. Let them lie thus seventeen days; and then in the middle of a warm, dry day carry them in, spread them on the floor, and take out any that are damaged. From time to time they must also be looked to, and any that decay picked out; the rest will thus be kept perfectly well.

The way to save seed is this: in the April following plant some of the finest of the onions that have been kept all winter, in a dry spot. Set them in a few inches into the ground, and at a foot distance every way. The best way is by opening trenches of three quarter spade deep, and placing the onions in them, then covering up with mould. In June they will flower, and the seed will ripen in August. The heads must then be cut off, and spread upon a canvass to dry; and, when they are

thoroughly hardened, the seeds must be shook out.

This is the management of the great crop of onions, for the root and for seed; but there should be also young onions for the spring, to eat with radishes and in salads. These are to be raised thus: in the beginning of August dig up a bed in a warm and well sheltered part of the ground: sow common onion-seed thick upon it, and rake it in. When the onions appear, keep the ground weeded, and early in the spring they will be fit for use. They should be thinned every gathering, no part of the bed being cleared entirely; and those which are left will grow to a larger size, and be very useful in the succeeding months, while the main crop that was sown in spring is taking its growth.

C H A P. XVI.

Of Leeks.

THE leek is cultivated just as the onion, and requires the same soil. Prepare the ground in the middle of March, and sow the seed tolerably thick; give now and then a gentle watering. When the plants come up, thin them to six inches distance, and keep the ground weeded.

Water

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Water them in dry weather, and they will require no more care. They may be either left in this bed, as is the usual way, or transplanted, which gives them a much larger growth. The method is this: dig up a large piece of ground in the beginning of June, and mark it in rows a foot distance; at every ten inches in these rows open a hole, and in a cloudy evening transplant the finest of the leeks out of the seed-bed, putting one in each hole. Water them every other day till they are well established; then keep the ground hoed once in three weeks, and the leeks will arrive at their highest perfection. They will not only be larger, but better flavoured by far than if raised in the usual way.

The common gardeners sow leeks and onions together; but they do better separate, and so do all plants whatever.

To save seeds, mark some of the best plants, and let them stand all winter. In February following plant them at half a yard's distance under a warm wall, and they will flower and ripen their seeds in perfection.

CHAP.

C H A P. XVII.

Of Welsh Onions.

THESE are stronger than the common onions; and are properly what authors call chiboule. They are excellent in spring as great onions, and are thus propagated. Dig the ground in August, and sow the seeds. They soon come up. Keep them clear of weeds; and when they die to the ground in autumn, sift over the bed half an inch of mould. They will appear again in February, and be fit to draw very soon. This is a method of rendering them very fine, and is a secret among the best gardeners. They keep in season from March to May; and some of the roots being planted out for seed in April, will ripen it by the end of September.

C H A P. XVIII.

Of Garlick.

GARLICK propagates so fast by the root, that, like the potatoe, it gives no occasion to regard the seeds. The separate parts of the root called cloves grow

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very

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very freely; and, if prevented from seed-
ing, will multiply very fast. In the beginning
of April chuse some fine fresh cloves;
plant them in a bed very well levelled, at
six inches distance every way; and once in
three days give a gentle watering; keep
the ground clear from weeds. The leaves
will soon be vigorous. In the beginning
of June tie them in knots, and continue
the watering; this tying keeps them from
running to seed; and then the leaves be-
gin in a few weeks to fade. They will be
thoroughly withered by the latter end of
July. Then take up the roots: spread them
on a mat, turning them every day; and,
after four days, put them up for use.

C H A P. XIX.

Of Rocambole.

THIS is a milder kind of garlick;
and is to be propagated the same
way by roots; which encrease abundantly:
chuse a piece of the ground that has a
little moisture; and plant some roots in
March, at five inches distance. Keep them
weeded, and sometimes watered; and,
when the leaves fade, take up the roots,
and preserve them in the same manner as
the garlick.

C H A P.

C H A P. XX.

Of Shallots.

SHALLOTS are of the onion kind, but strong. They encrease by the root as fast as garlick, and should be managed in the same manner. In the beginning of March, dig up a small bed: draw lines at five inches distance, and open small holes six inches asunder along the lines: in each hole place half a dozen little roots; and keep the bed weeded and watered; the leaves will soon appear; and these may be cut as young onions. They are what used to be called scallions, and are very fine. In August, the leaves naturally fade, and the roots are then to be taken up: they will be found vastly encreased in quantity; and they are to be dried upon a mat, and put up for use during the winter.

C H A P. XXI.

Of Chives.

THESE resemble the shallots in root and leaf, and are to be propagated in the same manner. The roots have less flavour than the shallots, therefore, are not

regarded; but the leaves are particularly mild, yet with the onion flavour; and are therefore valued in spring-sallads. In the beginning of March, dig up a small piece of a dry bed; draw lines lengthways, and across, at four inches distance: and, in the center of every square, plant three or four of the roots; cover them two inches, and give a gentle watering. The leaves will soon appear like grass, and, when they are five inches high, they are fit to cut. They will continue in season till the middle of summer. Soon after that they decay, and the roots are to be taken up, for planting again the next spring.

C H A P. XXII.

Of Beet Root.

TH E R E are two kinds of beet, the red and white; but the red only is regarded. The root is never fine, unless it has great depth, and a free soil: therefore, at the latter end of February, dig up a bed two spades deep, and break the mould perfectly: let it lie a week to settle; then rake the surface, and draw lines at a foot distance: open slight trenches along these lines, and drop in the seed, in a small quantity; cover it up, and, if the weather

be

be dry, give now and then a little water. When the plants appear, they must be thinned, to a foot distance, leaving the strongest. The ground must be hoed once in three weeks, and kept perfectly clean between the plants. In September the roots will be large enough for use; and will continue good all winter. In spring a few roots must be left to stand for seed, and the rest dug up; for they will be hard, and good for nothing.

CHAP. XXIII.

Of the Jerusalem Artichoke.

WHAT we call by this strange name, is a root not unlike the potatoe, but high flavoured. The plant is a kind of sun-flower, but of little beauty. It is to be propagated in the same manner as the potatoe.

In the beginning of April, dig up a piece of a bed; break the mould well; open trenches a yard asunder, and five inches deep. Chuse some fine large roots of this plant, and put them whole into the trenches, one at every two feet. Pieces will grow, but not so well. Cover up these roots, and leave them to nature. When weeds rise, hoe the ground; and

soon after the stalks will occupy it wholly, leaving no room for any thing else. In July, cut down the stalks to within half a yard of the ground, and give a large watering: this strengthens the roots, which a taller growth would have exhausted; and thus the Jerusalem artichoke will become large, tender, delicate, and of a fine flavour. If they were raised thus, generally, they would be more esteemed; but our gardeners let them waste themselves by running up to stalk, which spoils the root.

In the beginning of September, they are to be taken out of the ground, and kept in a dry place for winter-service, as potatoes; each root will have produced by this time more than twenty.

C H A P. XXIV.

Of Salsafie.

SALSAFIE is the root of purple goat's-beard: it is called also by some Artify.

In March, dig up a piece of a bed, two full spades depth; break the lumps well, level the ground, and sow pretty thick the salsafie seed: sift over it a quarter of an inch of fine mould.

When the plants are come up, thin them to a foot distance, and give them frequent

quent waterings. Keep the ground clear from weeds all summer; and, in autumn, take up the roots as they are wanted: they will be good throughout the greatest part of winter.

In spring leave a few for seed, and dig up the rest; for they will, by that time, be sticky, and useless.

The young shoots of *falsafie*, are excellent in the manner of asparagus. A particular bed should be sown for this purpose, and they should not be thinned. If they are sown the last week in March, the plants will be a span high in June; which is the best time to cut them: they may be cut as they are wanted, and will be good three weeks. These young shoots are an excellent dish.

C H A P. XXV.

Of Scorzonera.

THIS is a root not unlike the *falsafie*, but more delicate. Dig up a piece of a dry bed, two spades deep, in the beginning of April. Draw lines, at a foot distance; open trenches along these lines with a hoe, and drop in the seeds not too thick; cover them, and leave them to shoot. When the plants are up, thin

them to a foot distance, and hoe the ground as often as weeds appear. In September the leaves will fade; and this is a sign the roots are in perfection. They may be taken up from that time till the following spring; as they are wanted.

In spring, a few plants should be left for seed, and the rest dug up; for the roots grow sticky when they shoot for flowering. This, and the foregoing, are properly biennial plants; and the culture is the same, for all they are sown in spring. The first summer they produce only leaves, and so long the roots are tender, as also the following winter; but, when they rise to a stalk, the root has no more goodness.

C H A P. XXVI.

Of Rampions.

THIS is the root of a kind of bell flower, which grows wild in many places in England; but is greatly improved in gardens.

In the beginning of May, dig up a small bed, level the ground, and scatter on the seeds: sift over them a finger's breadth of mould, and leave them to shoot. When the young plants have got a little strength, thin them, to ten inches distance; and hoe the

the ground as often as weeds rise upon it. In the dry season, give the plants frequent waterings, and the roots will grow very fine. They will be fit for eating in October, and will continue good all winter. In spring a few plants must be left for seed, and the rest dug up, that the bed may be put to some other use.

CHAP. XXVII.

Of Dutch Parsley.

THIS parsley has a thick, white root, excellent for the table.

In March, dig a piece of a bed, not too dry: dig it full two spades deep, level the surface, and open trenches with a hoe, at fourteen inches distance: scatter in the seed of the true Dutch parsley thinly. In April the plants will begin to shew their strength; thin them, leaving only the strongest at about ten inches distance: hoe the ground once a fortnight, and give frequent waterings. In autumn the roots will be as big as middling carrots; and they will keep good all winter; taking them up as wanted. In spring, leave only a few for seed, at one corner of the bed; and dig up the ground for some other crop.

C H A P. XXVIII.

Of Skirret.

THIS is a sweet and delicate root; not growing single as the carrot or parsnep, but in a kind of natural bunches.

In the beginning of April, dig up a piece of ground a spade and half deep; and draw lines lengthway, and across, a foot and half asunder. This marks the ground into squares: in the center of each square, open a hole with a spade, and plant a single root of the skirret, parted from the general head: set it upright; gather the mould about it; and in this manner plant the whole bed. Each single root will encrease to a bunch, and they will be very tender. The ground must be all raked level over them; and when the plants are up, it must be hoed. From that time, it is to be kept quite clear of weeds till autumn: the roots will then be in perfection, and will continue so all winter. In spring, a new bed should be planted as the former, with some parted pieces of the finest roots; and the rest dug up for another crop.

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The skirret may be raised from seed, just as the several former kinds; but the roots will neither be so large nor tender.

C H A P. XXIX.

Of Horse-radish.

THIS requires a deep, and well wrought soil. In the beginning of March, dig up a piece of a bed, full two spades deep, and break it well; draw lines at two feet distance; and, along these, open trenches with a spade, eight inches deep. Cut off the heads of some horse-radish roots taken up for use, and part the off-sets from others, so as to get a sufficient quantity; the heads should be about three inches long: the off-sets will come off shorter; but they will grow at any length, provided the head be good. Plant these at the distance of sixteen inches, in the trenches, placing the head strait upright, and cover in the mould; rake over the whole surface level.

When the plants appear, hoe the ground between them: keep it clean till they have a little strength, and they will then take care of themselves.

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In this place, let them stand eighteen months, before they are touched; that is, being planted in spring, begin to take them up the autumn twelve-month following. In the mean time, if any of them shoot up a stalk for flowering, cut it down; but leave the full growth of the leaves at liberty, for they feed the root.

THIS produces a deep, and well wrought soil. In the beginning of March, dig up a piece of a bed, till two spades deep, and break it well, then lay it at two feet distance, and, along these, put weathers with a spade, eight inches deep. Cut off the heads of some horseradish roots in the autumn, and put the off-sets from one to another, for a foot clear distance; they should be about three inches long: these will come off sooner, but they will grow at any length, provided the land be good. Plant these at the distance of sixteen inches in the trenches, placing the head flat upright, and cover in the mould; take over the whole surface level.

When the plants appear, hoe the ground between them: keep it clean till they have a good strength, and they will then take care of themselves.

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SECTION II.

Of the Herbage cultivated in a Kitchen-garden.

THE plants cultivated for their leaves and stalks, and other parts above the ground, are more numerous than those whose roots are of service: and they are more various in their culture; some requiring but little management, and others a great deal. The dressing of the ground for roots will lead to the understanding the culture of these; which we shall render the more familiar, by beginning with the easiest.

C H A P. I.

Of young Salleting.

WHAT is called young salleting consists of the seed-leaves of several esculent plants, before they send out the rough leaves, or rudiments of a stalk. The best of these plants is the common radish; and those which are fittest to mix
with

with it, are garden-cress, mustard and rape.

The seeds of these grow very quick; and, by good management, they may be kept in a serviceable condition, from very early in the spring, till the time when lettuces, and other larger kinds, come in; and then these are naturally neglected for them.

The seeds must be sown for young salleting every ten days; and, in the earlier part of the spring, they must be raised upon warm and well-sheltered borders: afterwards upon the more open beds. The first sowings may be in February, upon the south borders, under the fruit-walls; and, as the season grows milder, the succeeding sowings, may be more and more in the open ground. The management is to be the same in all.

Open four trenches with a hoe, about an inch deep, and scatter in the seeds pretty thick; each kind in a separate trench. Many sow them all together; but they do not grow so well that way. Draw the mould upon them, and raise it in a little ridge upon each trench. Every morning, two hours after sun rise, give them a gentle watering. When the seed-leaves are fully expanded, the sallet is ready for gathering: this should be done
half

half an hour after the morning watering; and it should be laid in a cellar till it is wanted for table: for, if gathered at noon, when the sun is full upon it, it will have neither firmness in the leaf, nor the full flavour. The best proportion is equal parts of rape and mustard, double of radish, with about half the quantity of the others of cress.

This kind of sallet may be raised on hot-beds all the winter; but it has not the true flavour, unless it grows in the open air.

C H A P. II.

Of Lettuces.

WE have a multitude of varieties of lettuce; but they may be ranged under the two heads, Cabbage and Cos lettuce: of these, the first is the best for soups; and the latter for eating fresh. Of the cabbage kind, is the common lettuce, raised to cut young, and mix among other salleting. The culture of this is easiest of all; for it requires no transplantation.

1. *Sallet Lettuce*

In the middle of February, dig up a piece of one of the borders, under a south wall;

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wall; level the surface; and, in a calm evening, scatter on a good quantity of seed of common lettuce: sift over it a quarter of an inch of mould; and every morning give a very light watering: when the plants come up, encrease the waterings; and, as soon as they have six or eight leaves, begin to gather them, pulling up the largest. This will thin the bed, and the rest will grow the better.

Once in ten days, sow such a spot in the same manner; but, as the weather grows mild, let it be in the common beds, not in the first borders. Gardeners seldom bestow the trouble of sifting mould upon the kitchen-garden seeds; but no way of sowing answers so well, and it is no great matter to allow it.

2. *Cabbage Lettuce.*

This kind includes all those lettuces, which spread in their growth, and have a rounded body, with curled leaves: the Cos kinds rising higher, and having the leaves simple.

The cabbage lettuces are to be raised partly by simple sowing, and partly by transplantation.

In the latter end of February, dig up a piece of one of the warm fruit-borders, under a south wall; level the surface very well,

well, and sow the lettuce-seed not too thick: sift over it a quarter of an inch of mould, and water the bed lightly every morning. When the plants come up, weed the ground by hand, and draw away a few of the lettuces, where they rise very close; then water them, and let them stand till they have a little strength.

Then dig up another piece of ground, larger than the first; draw lines over it lengthways, and across, at a foot distance: thus divide the bed into squares. In the evening take up the finest of the young lettuces, a few at a time, and plant them, one in the center of each square: give these a very gentle watering. Pull them up, so as to leave the lettuces in the bed, at a foot distance every way; and, the next morning, give both beds another watering. After this, hoe the ground between, as often as weeds rise; and refresh them often with water: they will thus grow to their full perfection, and come in for use in a good season. Once in a fortnight, there should be such another sowing, for three or four times: and the plants of these several beds are to be managed just as the first. Thus there will be a long succession.

3. *Of Coss Lettice.*

The management of this differs scarce at all from that of the other; except in season, and the distance between plant and plant.

In the beginning of March, level a piece of a new dug bed under a south wall, and break the smallest lumps. Give this a very careful gentle watering; then drop in the seeds of Coss Lettuce: sift over them a third of an inch of mould; and now and then in a morning give gentle waterings. When the plants are up, manage them just as the Cabbage-Lettuce: transplanting them into a fresh bed, at half a yard distance one from another; and leaving as many in the mother bed, as can stand in the same manner. Once in three weeks repeat the sowing; and manage all the crops the same way: only as the season grows milder plant them in the open ground, and as it becomes hotter still, in places where there is shade. Thus there will be a succession of Cabbage and Coss-Lettuces thro' the whole summer: and from time to time the finest of each kind must be marked for seed.

4. *Of Winter Lettuces.*

Some of the largest of the Cabbage-Lettuces, will stand here the winter with due care; and will be very forward in the spring. The Dutch Brown Lettuce, is fittest for this service: but the culture differs from that of spring. In the middle of August, dig up a small border under a wall, level the ground, give it a gentle watering; and then scatter on the seeds not too thick.

Water the young plants often; and, when they are big enough to transplant, dig up for them the warmest and best sheltered spot in the whole ground. Draw lines at ten inches distance lengthways, and across; and in the center of each of the squares thus made, plant one of the young Lettuces from the seed-bed, leaving the rest at the same distance in that bed. Shelter them by a reed-hedge occasionally during the winter. If the season prove very severe, draw some matts over hoops, planted over the beds; and this way few or none of them will fail. The season at which they come in makes them valuable.

C H A P. III.

Of Corn Sallad.

THIS small herb is a native of our own country, and therefore requires little trouble in a garden.

It should be in perfection early in the spring; and to that end should be sown the preceding autumn.

In the last week of August, dig up a small open spot on any of the common beds; break the clods, level the surface, and scatter on the seeds of the Lambs Lettice, or Corn Sallad pretty thick.

When the plants appear, weed the ground, and take up some where they rise too close. They should be left at four inches distance. The ground must from this time be kept clean, and they will be in good order for the table early in the spring. The younger they are eat, the better.

C H A P. IV.

Of Spinnage.

WE expect Spinnage at various seasons for the table, and must therefore allow it different times of sowing.

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It is most advisable also to take advantage of the two kinds of Spinnage, one of which being hardier than the other, will stand the winter better. The two kinds are distinguished by their seed-vessels, which are prickly in the hardiest kind, and smooth in the other.

The smooth Spinnage must be sown in spring, to come to use in summer: but as we would have this kind continue several months, we must make three sowings.

About the middle of January, dig up an open spot where the mould is dry, one spade deep; level it with a fine rake, and give it a light watering. Three hours after this scatter on the seed pretty thick, and sift over it half an inch of mould.

When the plants come up, the ground must be weeded, and they must be thinn'd so as to stand about a finger's length asunder: from this time they must have frequent waterings; and they will soon grow fit for use.

When they are large enough to gather, they must be pulled up, so as to leave the rest at six inches asunder; and after this they must be again thinn'd to nine inches distance, taking up what are wanted for service.

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From this time the ground must be hoe'd once in three weeks, and what are gathered for service must be by way of absolute clearing the bed so far as the gathering goes.

In the middle of February, a piece of ground must be chosen not quite so dry as the first; and a second crop must be sown. This must be managed just as the former.

In the middle of March, a piece of ground still moister must be picked out for a third crop. These are the three principal sowings of the summer Spinnage; but it may be continued every month throughout the summer; always observing the latter sowings are, the nearer the spot is to be to the water, that it may be damp, and easily watered; for otherwise these sowings run quickly up to seed.

August is the time for sowing the rough Spinnage for winter: dig up a piece of ground a spade and half deep, level the surface, give it a good watering in the morning, and at evening sow the seeds pretty thick; sift over them a quarter of an inch only of mould, and water the bed every fourth day, unless natural rains fall.

When the plants are come up, hoe the ground, and clear them to four inches distance every way. Once in three week repeat the hoeing; and toward the end of October the Spinnage will be fit for service.

vice. It is not to be pulled up by the roots, but only the outermost leaves, which are largest, must be crompt off; this will give the inner leaves time to grow, and thus there may be gathering all winter.

The second sowings of the spring Spinnage is fittest for saving seed. Some of the plants must be left for that purpose at half a yard asunder: the ground must be kept clear between them, and they will ripen fine seeds. Some of the finest of the winter plants must be also cleared to a due distance in spring, and left for the the same purpose.

C H A P. V.

Of Cabbages.

THE Cabbage kind is very extensive, and perhaps, taking it together, the most useful of all the kitchen-garden products. Under the Cabbage kind in this light we comprehend the Savoy, Brocoli, and Cauliflower, which all properly belong to it; and we shall lead the gardener to the culture of the most difficult, by beginning with the easiest.

The common Cabbages may be divided into two kinds, according to the seasons when they come into use. These are the

summer and winter Cabbages. The summer Cabbages are to be sown in autumn, to be ready for the following summer; the others are to be sown in spring, for the service of the same year's winter.

Raise summer Cabbages thus. In the beginning of August, dig up an open piece of one of the beds, one spade deep, level it well; get some fresh seed of the SUGAR LOAF CABBAGE, and COMMON EARLY CABBAGE, and scatter it not too thick over the ground: sift some fine mould over it a quarter of an inch thick; and after two days, if no rain falls, give the bed a gentle watering.

When the plants come up, thin them where they are too close; and let them stand till they are four inches high, watering them every third day.

In the beginning of September, dig up a piece of ground, four times as large as the first, draw lines lengthways, and across: at four inches distance, and in the center of every square set one plant from the seed-bed. Give them a moderate watering, and repeat it every day till they are well rooted.

In the second week in October, dig up the bed for them where they are to remain. This must be greatly larger than the others; and dug up two moderate spades depth; draw

draw lines across at a yard asunder; and in a cloudy evening take up the Cabbage plants; and, opening large holes, plant them carefully along these lines at two foot asunder: water them till they have taken root. In the spring, when weeds rise, dig up the ground with a spade between the rows, and clean with a hoe between plant and plants; draw up the mould in a small heap round the stems of the plants; and once more repeat this, at the end of three weeks. After this hoe the ground as often as a quantity of weeds appear. Towards the end of May the plants will begin to turn in their leaves; tie the outermost of the leaves together at the top to promote this, and give them frequent waterings. These must be cut as they grow fit for use; and as the **EARLY CABBAGE** plants will come first, and the **BUGAR LOAF** kind afterwards, there will be between them a supply for the whole summer. The best winter cabbages are the common white, and common red, the flat, and the long cabbage. These are to be treated exactly alike. In the beginning of April, dig a piece of ground one spade deep, level it, and sow the seeds. The plants will soon appear, and where two or more grow together they should be cleared; and thus they may stand till the middle of May: then dig

dig up a cool part of the ground, not open to the sun; draw lines at four inches distance both ways, and in the center of every square set one of these plants; chusing a cloudy evening for the purpose. Water them till they are thoroughly established. When they have stood three weeks in this bed, dig up one then much larger, and full two spades deep: draw lines at a yard distance over this bed; and plant out the cabbage plants, at the distance of a yard one from another along these lines. Give them a good watering; and repeat this every other day, till they are perfectly established; three weeks after they are planted, hoe the ground, and draw up some mould round their stems. A month after that turn up the earth between the rows with a spade; and from that time, as often as weeds rise, let the ground be carefully hoed; always drawing up the earth about their stems.

About the middle of October the cabbages will come into use, and they will continue thro' the whole winter.

C H A P. VI.

Of Savoy's.

THIS is one of the cabbage kinds, and being hardy, is raised for winter-service.

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In the beginning of April chuse an open piece of ground; dig it one spade deep, sow the Savoy seed moderately thick, and only rake it in.

When the young plants have strength enough to bear moving, which will be about the middle of May, dig up another bed, and plant them in it at three inches distance. Water them every other evening, till they have taken root. Let them stand in this bed five weeks: then dig up a large open piece of ground full two spades depth; mark it out in lines, two foot and a half a sunder and in a cloudy evening transplant the Savoys from their second bed. Place them at two foot distance in the rows; open a large hole for each, and close the mould well about their roots, drawing it up also about the stems. Give the plants a moderate watering; and repeat it every evening till they are well established; then once in three weeks hoe the ground, and every time draw up some mould round the stem: thus they will take their growth till winter; and as soon as the frosts set in, they will be fit to cut. They will continue good till spring.

They will continue good till spring.

C H A P. VII.

Of Borecole.

THIS is another of the cabbage kinds, of which we have two sorts, a red and a green. They are curled and fringed as it were, and are naturally tough; but the frosts make them tender, and good. Watering has great effect the same way.

At the latter end of March dig up a small piece of ground one spade deep, level it, and sow the borecole seed pretty thick, and rake it in: When the plants have got about five leaves a piece, dig up another piece of ground, and plant them in it at three inches distance; water them well till they have taken root. Let them stand six weeks in this bed, hoeing them well about the middle of that time: then prepare a large piece of ground for them, dig this a spade and half deep, draw lines lengthways and across, two foot asunder, and plant the borecole plants, one in the center of each square; open a large hole for each, fix the mould well about it, and draw up some about the stem. Water them till they are very well established; and then only hoe the ground carefully, as often as weeds appear; about the middle of December they

they will begin to be good, and will continue so till April. They have a peculiar taste, with some degree of bitterness in it; but they are far from disagreeable.

C H A P. VIII.

Of Colewort.

THE colewort is another of the cabbage kinds, and is hardier than any other. When winters are so severe as to destroy the common cabbages, this stands, and is better for the frost. Some of these should always be raised in a family kitchen garden; if the winter proves mild, they may be eaten by servants, if hard, they will be very useful to the master.

In March dig up a small bed, and sow the seeds of colewort. When the plants are three inches high, remove them to a new bed at three inches distance, and let them stand a month; then dig up a large open piece of ground, and transplant them again at a yard square distance from each other. The method of doing these operations must be the same as in the preceding kinds; and great care must be taken at the approach of winter, to draw up a good quantity of mould about their stems. They will thus take their full growth, and be fit for use by

by the end of December, and will continue good from that time thro' the winter.

C H A P. IX.

Of Brocoli.

TH E R E are two principal kinds of brocoli, the purple and the white. The purple is the best. Take care to have good fresh seed; and the last week in May dig up a bed one spade deep near the water. Level the surface perfectly, then give it a gentle watering, and in the evening after spread the seed thin with an even hand; sift over it a third of an inch of fine mould, and two days after give it a gentle watering.

When the plants come up, pull up a few where they stand very close, then water them every evening, and let them stand in the seed-bed till they have seven or eight leaves a-piece.

Then dig up a larger bed, in a place also near the water: draw lines both ways over it at four inches distance, open a hole in the center of each square, and plant one of the plants; water them gently as soon as are they in the ground, and more largely afterwards; keep the ground perfectly clear from weeds between them by frequent hoeing.

When

When they have stood five weeks in this bed, plant them out for the last time. Dig up a piece of ground that is well sheltered, but not over-hung: dig it two full spades depth, and level the surface: draw lines at two foot and a half distance, and plant the brocoli at a foot and half distance in these lines. Open a large hole for each plant; trim the fibres, and fix it well in the ground, draw up some mould at a small distance round each plant, and give a large watering: repeat this every evening for a week; then draw the mould up about the stems, and leave them to nature. Once in three weeks hoe the ground; only instead of the second hoeing dig up the space between the rows a full spade deep, and clear between the plants with a hoe. Thus they will come to their full perfection. About Christmas the heads will begin to appear; they may be cut early in January; and the plants will continue fit for service ten or eleven weeks.

We direct a little more trouble in the culture of this, and other choice products of the kitchen-garden, than is generally allowed; but it will answer excellently. We can say from experience, that five pounds a year more being thus expended upon an acre and half of kitchen-garden, which is the moderate proportion for a common family, will produce one third more of the
several

several kinds, and all of them in a much greater degree of perfection. The true Roman or purple brocoli managed thus, will have heads like small cauliflowers.

C H A P. XVII.

Of Cauliflowers.

WE enter here upon the culture, not only of the nicest of the cabbage-kind, but perhaps the most delicate plant in the kitchen-garden. The cauliflower is a peculiar luxuriance of the budding of the plant; and, if every article be not observed, it will never succeed in due perfection.

Take great care to have good seed. Then, about the 26th of August, clear and level the surface of an old melon-bed, and drop on the seeds regularly, and not too thick. Sift over them a quarter of an inch of the finest mould; place some hoops over the bed; and every day, from ten in the morning till three in the afternoon, draw a mat over them, to shelter the bed from the heat. The next evening, after sowing, lay a mat upon the surface of the bed, and water the ground thro' it, gently, and by a little at a time. By this means the water will gradually penetrate into the ground, and not dislodge or disturb the seeds. Re-

peat this every evening, but give only a moderate quantity each time.

With this management the young plants will appear about the first of September. Continue to draw the mat over the bed every day at noon; and, if the nights are sharp, do the same in the evening, to shelter them from the cold. If they rise very close any where, pull away a few of the weakest in these places. Let them stand in this bed till the end of September; then prepare another bed of the same kind as the first for them, but larger. The old cucumber beds, and other hot beds, are by this time useless for any thing else, and they very well answer this purpose. But where there are not these, a slight hot bed may be made of a little dung that has lost its first heat, and covered deep with mould. In either case let the coat of mould be of the very finest kind; and it must be five inches thick. Draw lines upon this lengthways and crosswise, at two inches and a half distance. In a mild, and moist evening, take up the plants from the first bed, and carefully set them in this, placing one in the center of each square; open carefully the hole for each, and close the mould well about them. When all are planted, give them a very careful and very gentle watering, and then draw the mats over hoops placed about this

G

bed

In this bed let them stand a month. It will then be toward the beginning of November: then make up carefully a bed for them, and plant them out in an evening at such distance, that they can be covered with hand-glasses, to defend them from the cold. The place must be a warm and well-sheltered spot, and, where-ever it wants defence, it must have it by means of a reed-hedge. Dig up the mould two full spades deep, and bury some rich compost in it as it is dug: raise it up in beds half a foot above the rest of the ground: let them be as long as the ground will admit, and three-quarters of a yard broad; and make the mould very fine that comes at the top of them, for a good spade deep. The beds must be a yard and a quarter asunder, and then a line being drawn lengthwise along the middle of each bed, open two holes for two plants within half a foot of each other, two feet from the end of the bed, and proceed all the length of it, opening the holes two and two, at the distance of three-quarters

ters of a yard, pair from pair. Plant out the cauliflowers from the last bed very carefully into these holes, and one glass will thus all the way cover two plants. As soon as they are in the ground, give them a moderate watering, and then put on the glasses. Press them close down, and thus let them remain a week. The plants will by that time be well rooted and established: if not, the glasses must be kept close down four or five days longer.

When they are very well rooted in the bed, raise the edge of the glass that is toward the south about three inches, in the middle of a warm day. A brick-bat is commonly used for this purpose; but a forked stick is better, because the glasses may be raised higher or lower with this at pleasure. As long as the weather keeps tolerably mild, the glasses may be left raised thus much day and night: but when the frost grows sharp, the glasses must be shut down close all night, and in very bad weather the whole day also, only now and then raising them a little in the middle of the day for a quarter of an hour. On the contrary, in remarkably mild winters, the glasses may be set aside all day, and only put over the plants during night. Thus they are to be kept in a state of health during the winter. Early in spring one

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half of them must be removed into the open air.

In the first week of March, dig up for this purpose a piece of ground in a warm part of the garden. Dig it full two spades deep, and bury in the bottom some good compost. Draw lines upon this bed at a yard and a quarter distance from one another, and open a hole at every two foot and a half along each line. Then in a mild evening look over the cauliflower plants, and in every place of a glass which covers two, take up one. Let this be the weakest of the two. Close the earth carefully about the other which is left, and take all possible care not to hurt it; then plant those which are taken up, one in each hole of the new bed; plant them carefully, and draw up some mould about their stems. Do the same to the others; and the next morning give them all a careful watering. From this time treat both parcels alike, only not entirely removing the glasses from these of the original bed, but raising them four inches from the ground all the way round. Whenever there falls a warm shower, take off the glasses, that the plants may have the benefit of it. At other times water both beds once in about four days; keep the ground perfectly clear from weeds throughout the whole beds, and hoe it deep
every

every ten days, raising a heap of mould each time about the stem of every plant. Toward the end of April keep the glasses off all day, but put them on for the night; and by degrees leave off this; only putting them on for the night in bad weather. The plants will be forwarder than those in the open bed; and thus there will be a longer succession of the plants in perfection.

In the beginning of May, the cauliflowers will begin to form themselves in the center of each plant: then break inwards one or two of the innermost leaves to shade them, and afterwards more as they encrease in bigness; in three weeks more some of the forwardest of those in the other bed will do the same, and they must be treated in the same manner.

The cauliflower should be left to grow till the outside pieces begin to spread. This is a proof that it is at the full growth, and it should be cut. The proper time of cutting them is about nine o'clock in the morning; and they should be laid by in a cool cellar till they are wanted.

These two plantations will supply the table during the months of May, June, July, and part of August. But as it will be agreeable to have them yet longer, it will be necessary for that purpose to sow some seed upon a hot bed in spring. In

the beginning of February open a trench in the ground a spade deep: lay in some horse-dung that has lain a week to loose its first heat, beat it close, and cover it ten inches thick with mould. Level the surface of this, and sow the seeds: sift a quarter of an inch of mould over these, and place some hoops over the bed; upon which draw a mat to shelter the seed, and keep in the warmth: the day after give a gentle watering thro' a mat as before directed, and repeat this every other day. At noon raise up the mat a little at the edges, but at other times keep it carefully down. When the plants come up, give them very gentle waterings; and, as soon as they have about five leaves a-piece, transplant them into another bed, with dung under it, at three inches distance. Here manage them as the former, and in the middle of April plant them out as the others. These will come into use at the end of August, and will continue till November, or, in mild winters, longer than that. A third sowing may be made the last week in May, for very late cauliflowers; but the two here directed, with good management, will furnish cauliflowers from the month of May to December; and none can wish them longer.

C H A P. XVIII.

Of Scotch Cale.

THERE remains yet one kind of cabbage-plant to be named, the Scotch cale. This is the hardiest of all the sorts, and therefore has its value. It thrives in the severest winters, and supplies the table even when the common colewort is destroyed. Its season being late in winter, it must be sown in July. For this purpose dig up a small bed a slight spade deep. Sow the seeds moderately thick, and rake them in. They will require only a little watering in the driest weather. When they are three inches high, dig up another bed a spade and half deep. Mark it out in rows a yard asunder, and transplant the plants into these rows at a foot and half distance. Give them two waterings at three days distance, and then hoe the ground once in a month. They will thrive greatly, and be fit for use in the severest part of winter.

The seeds of the cabbage kind are to be saved from plants taken up in November, and planted deep in the ground under a warm wall: the whole stem, and some part of the body of the cabbage, should be buried; and in the depth of win-

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ter a little pease-haulm should be thrown over the ground. - After this they will flower with vigour, and the seeds must be gathered as soon as ripe.

For saving seed of the cauliflower, fix upon some of the very finest when in their perfection: these must be such as are large, of a pure white, and very firm. They must not be transplanted, but managed rightly where they stand. The leaves must be kept bent in over the cauliflower, till it begins to break, and shoot up into branches: then by degrees give them way, first by opening, and thereby taking the leaves absolutely off.

Once in four days give these plants a moderate watering; and as they grow up thrust a hedge-stake firmly into the ground close to each plant: tie the stems to this in two or three places as they rise. When the plants are in flower, give them sometimes a little water; and when the seeds are forming, water them all over more freely. When they are come nearly to their full size in the beds, leave off the watering, and they will harden to perfection. Dry them in an airy room, first in the pods, and then loose.

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C. H. A. P. XIX.

Of Celery.

THE foot-stalks of the leaves are what we eat in celery; and the great art is to raise them to a due size and tenderness, and keep them as long as may be in that state. When the plant shoots up a stalk for flowering, the part we eat is good for nothing. We are not to depend upon any one crop of it long together; therefore we must repeat the sowings. Three sowings will keep up a supply of this kind; and the first of these should be in the first week of March, the second in the third week of that month, and the third in the middle of April.

The first seed-bed will require a little warmth, but the others not. The first week in March dig a trench in the ground a spade's depth, a yard wide, and in length proportioned to the quantity of plants intended to be raised. Lay in some dung that is about a week old, and beat it flat: let it lie a foot thick: cover it with seven inches of mould, and upon this sow immediately some good seed of celery. Sift over this a full half peck of the finest mould, and place hoops over the bed; upon which draw

draw a mat. Let the bed be covered thus all night, but raise the mat a little in the middle of the day, and once in three days give a very gentle watering.

With this management about the twenty-fifth of March the young plants will appear. Thin them where they rise too close, water them once in two days very gently, harden them more and more by degrees by raising the mat, and let them stand in this bed till the beginning of May.

At that time dig up a piece of ground where it is moist and sheltered. Level the surface, and draw lines at three inches distance. Then take up some of the strongest plants from the seed-bed, and plant them along these lines at two inches and a half distance. Set them carefully in the ground, and give them very gentle waterings till they are well rooted; shading them also with mats, as in the seed-bed.

A week after this dig up such another bed, take up some more of the strongest plants in the seed-bed, and plant them in this new ground as the others.

A week after this the remainder of these plants in the seed-bed will have got strength enough to be removed, and a third piece of ground must be prepared for them, and they must be planted in the same manner.

All these must be nursed up with the same care. They must be sheltered in coldnight with mats, and watered once in three days. They are not to remain in these beds, but are to be planted out at more distance than they stood originally, for the sake of getting strength. And thus from the first sowing there will be three distinct plantations, all of which are to be afterwards planted out again and blanch'd: these will make a considerable continuance and succession; and there will be beside the two succeeding sowings, from each of which will also rise a lasting succession. The choice of the ground for these late sowings will in a great measure determine their success. The second should be made about the twenty-first of March, and the spot should be warm, and sheltered: dig the earth half a spade deep, and level it perfectly; then sow the seeds, and sift over them a third of an inch of fine mould. Shelter these a little by a mat if very bad weather happen; and for the rest proceed as in the former instances.

About the eighteenth of April make the third sowing: chuse for this a moist piece of the ground, and cover the seeds only a quarter of an inch. The young plants from both these sowings must be transplanted when they have been a month above the ground,

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ground, and managed just as those of the first sowings.

We shall thus have the several parcels of plants in their vigour, and are to think of planting them out for blanching. The choice of ground for this service is also very essential; it must be in a moist part of the garden; and the earth must be dug up full two spades deep, and perfectly well broken. When this is done, and the surface level, draw a line a foot from the verge of the bed, strait across; then remove it ten inches forwarder in the bed, and draw another: dig up the mould between these two lines, making a clear trench nine inches deep; throw out the mould clean, then dig up the bottom of the trench lightly, and break the earth there. When this is done, move the line a yard forwarder in the ground, and there open just such another, and thus go on till the sufficient quantity of ground is done; in a damp evening remove the plants to this trench. Take them up carefully, trim the ends of the fibres, cut off the tops of the longest leaves, and set them carefully in the middle of the trench, at nine inches asunder; gather the mould well about them, and give them a moderate watering: repeat this every other evening till they are well rooted. The forwarder plants will be ready for transplanting about the latter end of
May;

May; and the others from the several sowings should be treated in the same manner, as they grow successively fit for it. The plants will soon grow in height, and the mould that was thrown out in making the trench must then be laid in again; a little at a time, as it is required. This must be drawn up close about the plants as they rise; only taking care not to bury the hearts of them. When the mould is thrown in, and the trenches are filled up, the space between row and row must supply mould for the blanching the plants. Dig up the center of each space, throw up the earth in a ridge, and leave it to be broke by the weather, a week or ten days before it is wanted. Then, once in about nine days, draw some of this up on each side of the plants in a ridge, to cover them all but the heart: and continue this till the ridges are a foot above the surface: by this time the plants will be fit for use, they will be a foot and half long in the fine clear part, and they must be taken up as wanted.

There is to be no difference in the management of the other crops, of the latter sowings: when they are of a size for transplanting, they are to be trenched in the same manner, and earth dug up till they are of a height for use.

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The celery of the first planting will be fit for use at the end of June, and the rest will come in succession throughout the whole winter, and till late in the spring: if the winter proves very severe, there must be a little straw thrown lightly over the ridges of celeri; and it will preserve them: but it must be removed when the frost is over. In spring a few of the best plants may be suffered to run up to stalk, and and they will furnish seed in abundance.

Some are fond of the thick-rooted celery, which is called celeriac; but it is less delicate than the former. However as it is raised with little trouble, it is worth while to have a bed of it. Sow the seeds of this kind the first week in April, upon a piece of moist ground: as soon as the plants are of a size to remove, plant them into trenches of only three inches deep. Thus let them stand till the roots are as big as small turneps, and then cover them up to the leaves with mould for blanching. These will require no more care; only the ground must be kept clear from weeds; and they will be fit to eat after five weeks blanching.

C H A P. XX.

Of Endive.

THIS is a plant of the dandelion kind, whose leaves are naturally broad; and become large, jagged, and delicate by proper culture. It has the dandelion bitter in it, but good management leaves no more of this than is agreeable. This herb is in its perfection in autumn; and lasts all winter with due care: to preserve it so long there must be different sowings. I would advise four: the first in the middle of May, the second at the end of that month, the third about the fourteenth of June, and the last about the eighteenth of July. All these sowings are to be managed alike, except that the first must be on a cool, and somewhat shaded piece of ground, to prevent the young plants from running up too fast to seed.

The ground must be well broke, and the surface perfectly level, then the seeds scattered on not too thick, and raked in. Once in four days give the ground a little water, unless natural rains make it unnecessary. When the young plants come up, thin them a little, weed the beds, and water them lightly and often.

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As soon as they are grown to three or four inches, dig up a piece of ground for transplanting them, break the mould well, level the surface, and give it a moderate watering. Then draw lines over it at fifteen inches distance; and all being thus prepared, begin to take up the plants. Take up about a third part from the seed-bed, and let these be the strongest plants: crop the top of the leaves, trim the fibres, and plant them in these lines at a foot distance; give them a moderate watering, and repeat it daily till they have taken good root. Ten days after take up another parcel, and plant them in the same manner; and after ten days more, take up the last, and thus serve every seed-bed. By this means there will be twelve beds of endive, from the four sowings which will come in succession, and be fine throughout the winter.

When the plants are grown to such a size as to be fit for blanching, this is to be done by tying the leaves together near their tops. About the middle of July, some of those which were first planted out will spread, so as to meet in the lines; and this is the time of doing it. The best thing is some threads of old matting, which the Gardener's call *Bass*. It must be done when the plants are perfectly dry; therefore the best time is about three o'clock in
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the afternoon of a dry day; gather up all the inside leaves together; and then draw up the outside leaves round them; the first will make a head in the inside, which the others will cover. Then tie round a piece of bafs, within an inch and half of the top; and thus manage all that are ready for blanching. Eight days after go over the bed again, tie up fuch others as are fit; and tie a fecond piece of bafs round the middle of each of thofe that were tied up firft.

About five and twenty days is the time they require for being perfectly blanched; they muft then be taken up as they are wanted. In the tying up the plants all the decayed outside leaves muft be pulled off, and thrown away; and if there be any of the plants which run up to ftalk, they muft alfo be pulled up, for they will never come to any thing. This muft be the management of the plants from two of the firft feed-beds, and it will continue in ufe all fummer; but this practice will not fucceed in winter, for the infides would rot.

Therefore having by this method of blanching, fupplied the table for the months of July, Auguft, September, and part of October, prepare for the winter in this manner: In a warm fpot of the ground

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facing

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facing the south, dig up the earth, and raise it into ridges, with a pretty steep top. Take up the plants which appear fit for blanching, and plant them at a foot distance on the south side of each ridge, bury the whole body of the plants, only leaving out the tops: they will immediately take root, and will blanch very well in this manner, notwithstanding rain and frost; only if at any time the weather should be extremely severe, a little pease-haulm must be thrown over the ground once in a fortnight from October till spring; raise up a ridge of this kind, and plant in a certain number of the endive plants. About six and twenty days will blanch them perfectly; and they should be then taken up for use directly, because otherwise they will spoil. For a supply of seeds mark some of the finest plants, that is, those which have the largest and most curled leaves; leave them in the bed when the others are taken up for blanching, and let them stand the winter. In the beginning of April, transplant them into a south bed near a warm wall; set them a yard distance, and as the stalks rise tie them up to sticks. When the seeds are ripe and dry, tie them up in paper bags, and take care they get no harm till the time of sowing.

CHAP. XXI.

Of Purslain.

THIS is easily raised in the open ground, tho' a native of a very warm climate; in the middle of April, chuse a warm spot, and dig it up one spade deep; level the surface perfectly, and give it a gentle watering in the morning. In the evening rake it well with a fine rake; then mix some purslain seed, with a little very dry mould, and spread it carefully over the bed; sift upon it a quarter of an inch of mould, and once in two days water the bed gently thro' a mat.

When the plants come up, thin them to a foot distance, and keep the ground constantly weeded and watered; they will grow to a size for use in about five weeks.

Three weeks after the first sowing, make a second in the same manner, and continue this once in three weeks till August, that there may be a constant supply of young and nice plants.

Leave a few of the largest plants of the second sowing for seed, and preserve it carefully when cured and dried.

C H A P. XXII.

Of Finochia.

THIS is a blanched product of a fennel, but a particular kind, and is much esteemed by some. Procure some good seed from Italy, of the last year's plants; and in the middle of March sow this upon a bed well dug, and level'd for that purpose; scatter the seeds thin, and sift over them half an inch of mould. When the plants are come up, thin them to about three inches asunder; and as soon as they are large enough to transplant, dig up another bed; open some trenches by a line three inches deep, and two foot asunder; break the earth well at their bottoms; and in a mild evening take up the young plants, set them carefully at a foot distance in these trenches, and water them till they are well established. The stalks will then begin to swell just above the ground, and a little fine mould must be drawn up about them to favour this: then they must be watched and earthed more and more, as they continue to swell: by this means the stalk will grow as large as one's hand, and be very tender and delicate.

Once

Once in three weeks a fresh parcel of seed may be sown, and by this means a supply kept up during the summer.

C H A P. XXIII.

Of Chardons.

THIS is the blanched stalk of a kind of artichock, and is very delicate.

About the twentieth of March, dig up a bed for the seed one spade depth, level the surface, and scatter on the seeds not too thick.

When the plants appear, thin them to three or four inches distance, and water them once in two days, keeping the ground clear from weeds. When they are strong enough to transplant, dig up a fresh bed larger than the first, and mark it out by lines a yard and half asunder. Take up the plants, and set them carefully at a yard distance along these lines, give them a good watering; and repeat this till they are well established. About the middle of June, they will be ready for transplanting; and when they are once rooted in the bed, they will grow apace: as they grow up the mould must be drawn up about them in a kind of hills, to near the tops of the stalks. When they are thus brought

to be tall and strong, the tops of all the foot-stalks must be gathered together, and tied round with a parcel of bass, and the mould then is to be drawn up about them in a large hill, nearly to their tops. They will thus blanch very perfectly, and will be a yard high, and as white as cream, perfectly tender, and fine tasted: to keep up a succession of them for a considerable time, there need not be repeated sowings of the seed; only the plants should be earthed up in succession, a certain number every fortnight or three weeks,

C H A P. XXIV.

Of Chard Beets.

THIS is a sort of beet raised for the leaves, not the root; they are valuable for soups. About the twelfth of March dig up a bed for the seeds, a spade and half deep, level the surface, and give it a gentle watering; and the next evening sow the seeds of the true Swiss chard beet, not very thick; rake them in; and once in two days give a little water to the ground. When the plants are come up, and have a little strength, hoe the ground, and clear them to four inches distance; three weeks after this hoe the bed again, and

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and then clear them to six inches distance; and
after three week more clear the bed again,
and leave only the best of the plants at
thirteen inches asunder: then they will
take care of themselves; they will soon after
be fit for use. The outer leaves only are to
be cropped off when wanted; and thus the
young ones left in the center will grow
larger, and there will be a constant supply
for the season.

C H A P. XXV.

Of Chervill.

THIS is a kitchen-garden herb, of
very easy culture, there follow also
some more such, after which we shall come
to the capital products of the kitchen-
garden fruits. Gather the seeds of chervill
as soon as they are ripe, which is in the
end of June, spread them on a dry floor to
harden, and as soon as they are fit to sow
on the ground, dig up a bed in the
north quarter of the ground of eight spades
depth, level the surface the second week
in August, and water it lightly. Scatter
on the seeds moderately thick, rake them
in, and leave them to nature. In the begin-
ing of September the plants will be up,
thin them soon after to four inches distance,

and once in three weeks hoe the ground. In October thin them to a foot distance, leaving the strongest plants; keep the ground clear between these by repeated hoeings, and they will in spring be fine plants. They may be used from November to April, but are in their greatest perfection in March. A few plants must be left for seed at a yard distance from one another, and the seed saved for a succeeding crop, as before directed.

C H A P. XXVI.

Of Sorrel.

TH**E**R**E** are three kinds of sorrel kept in the kitchen-garden; the common meadow sorrel, which grows very large, with this culture, and is really the best of all. 2. The barren sorrel so called, because it scarce ever flowers. And 3. the French sorrel.

To raise common sorrel, dig up a bed in the north part of the garden, a slight spade deep. In the beginning of March, sow the sorrel-seed not too thick, and rake it in.

When the young plants come up, thin them to four inches distance, and weed the ground. Once in a week give a moderate watering,

watering, till the plants are grown to some strength.

Then dig up a larger bed near the first, a full spade deep; draw lines over this at ten inches distance; and at every eight inches in these lines, set one of the plants from the seed-bed, keep the ground clear between them, and they will thrive vastly. Every year let a few flower, and stand for seed; and renew the crop yearly; for the leaves are never so tender as while the plants are young.

The barren forrel encreases vastly by root, and must be propagated by parting the shoots: the best season for this is early in spring. About the second week in March, dig up a bed in a north part of the ground, a full spade deep; mark it out by lines a foot distance, lengthways and across; then get some good roots of this forrel, part them into moderate parcels, and plant one in the center of every square. Water them every other evening till they are well rooted; and keep the ground clear from weeds.

The French forrel is to be cultivated in the same manner; and all that is required afterwards is to cut down the leaves every three weeks to the ground, first in one part, and afterwards in another, that there may be always a young growth in some part
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of the bed, and every other year to renew the plantation upon a different piece of ground.

C H A P. VXXII.

Of Mint.

DIG up a piece of ground in the north part of the kitchen-garden, and near the water, in the beginning of April. Level the surface; give a good watering; and then open deep furrows by a hoe at six inches distance. And in these plant some parted roots of common spear-mint, at the distance of five inches asunder. Cover in the mould; and, when seven such rows are planted, leave a space for a path, and then plant seven more in the same manner. When all are covered up, give the ground another good watering. The mint will soon rise in great abundance and perfection. Once in five years change the ground: taking up the roots, and planting some of the finest of them as before directed.

This is the common culture of mint; but there should be some also forced for early service.

About the twelfth of December dig away the mould for a trench one spade deep and a yard wide; in this lay a foot and half thickness

thickness of dung that has just lost its first heat. Cover it with eight inches of mould, let it lie four days to warm, and then draw lines upon it four inches asunder. Take up some good roots of mint; and plant them in moderately large pieces, one at every four inches distance in these lines. Place some hoops over the bed, and cover it with a mat. Water the plantation often, and it will soon produce. The shoots are to be cut young, and there will be a long succession. At six weeks distance make another bed, and the table will be very well supplied till the common mint comes in.

C H A P. XXVIII.
Of Baum.

THIS spreads part of the root, and is to be propagated by parting it in autumn. About the tenth of October dig up a piece of ground a full spade deep; it should be near the water, and open to the south-west; divide it by lines two feet asunder, and at every foot and half along the lines open a hole. Take up some very good roots of Baum: part them into moderate pieces, and plant one with about five or six good buds on it in each of the holes. Rear them up, raise the bed level, and give one good watering.

watering. After this now and then clear the ground from weeds till the plants are strong; after which they will not suffer any to live among them.

Never suffer the plants to flower, but always cut down the stalks when they come toward it; and once in two years dig up the whole bed; and make a new plantation with some of the best roots, in another place.

C H A P. XXIX.

Of Summer Savory.

IN the beginning of April dig up a bed in a warm part of the ground a full spade deep; level it, give a gentle watering in the morning, and in the evening sow the seed of summer-savory pretty thick. Sift over this a quarter of an inch of very fine mould, and thus leave it. The plants will soon appear: when they have a little strength, thin them to three inches distance, then give a gentle watering. Keep the ground clear of weeds, and in three weeks more weed the place again, and clear the plants to ten inches asunder: they will then grow quickly to their full perfection. A few of the most promising must be left for seed, and the rest pulled as they are wanted.

C H A P.

C H A P. XXX.

Of Winter Savory.

IN the beginning of September dig up a piece of a bed in the driest part of the garden. Level the surface, sow some seeds of winter-savory not too thick, and rake it in. Three days after, if no rain has fallen, give a little water: when the plants appear, thin them to four inches distance, and weed the ground: they will stand the winter; and in April they should be again thinned to a foot asunder, weed and water the ground at the same time, and in a few weeks the plants will be fit for use. The young shoots are to be cut when wanted, without disturbing the roots. The plant will last a long time, but it is best when young: therefore the best way is to sow a small bed of it every August; and dig up the last as soon as this is fit for service.

C H A P. XXX.

Of Borage.

THIS sows itself in kitchen gardens, and the owner is content; but its duration that way is limited to a very small

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small part of the year : whereas, with a very little care, it may be kept in flower all summer. The first week in September, dig up a small piece to the south, rake it and scatter on some seed of borage, and rake them in.

When the plants come up, thin them to a foot distance, water them, and now and then hoe the ground between.

In April sow a fresh parcel of seed in another part of the ground, about the eighteenth of May dig up a shaded north border, and sow some more ; treat these in the same manner as the first. The autumn plants will flower from May, to the middle of June, and the two others following one another will last till October in bloom. The flowery tops of this plant only are used ; but their agreeable flavour and cordial virtue ought to recommend them greatly.

C H A P. XXXI.

Of Parsley.

COMMON parsley, which is raised for its leaf, requires a different culture from that which we have learned from the Dutch, to raise its root. About the eighth of March dig up a piece of ground, a full
spade

spade deep: open drills along it with a hoe; of eight inches distance; sow parsley seed moderately thick in these, and cover it about one-third of an inch. Once in five days water the ground: when the plants appear, which will be about the twentieth of April, clean the ground perfectly between the rows, and thin the plants to four inches distance: the second week in May pull up more of them, leaving only the most flourishing; and these at about seven inches one from the other, and alternate, not opposite in rows; hoe the spaces between the rows, and give the bed one more watering. This is all the care it wants: the parsley will soon meet, and cover the the whole ground, and will be in the highest perfection. A few fine plants should be left for to run up to seed, and the plant above made new every year in a distinct piece of the ground.

CHAPTER XXXII.

Of Burnet.

THIS is a most excellent salad herb; but not enough regarded.

In the beginning of September dig up a bed, open to the south west; level the surface, water it lightly in the morning; and at evening

ing sow the seed of burnet pretty thick : sift over it a quarter of an inch of mould.

When the plants appear, thin them to four inches distance, and weed the ground. Thus let them stand the winter : then, in the beginning of April, hoe the ground again, and thin the plants to a foot distance. Give them a watering upon this, if there be no natural showers ; the leaves will soon be fit for use, and will continue so all the summer. A few plants should be let to run to seed, and all the rest pulled up for a yard space about these.

Every season there should be a sowing, for the plants are never so good as the first year, and every year the bed should be changed.

C H A P. XXXIII.

Of Marygolds.

THE last week in March dig up a piece of ground, open to the south, and level the surface. Give it a watering in the morning : in the evening rake it again, and scatter on some good marygold seed, not too thick ; sift over it a quarter of an inch of very fine mould.

When the plants appear, thin them to four inches distance, and weed the ground.

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Three weeks after hoe the ground, and clear the plants to fourteen inches asunder, and thus leave them to their growth; water them sometimes, keep the bed clear between them; they will begin to flower in June, and last flowering till October. A few fine plants must be reserved for seed, which should be carefully preserved, and a fresh bed sown with it in the succeeding spring.

C H A P. XXXIV.

Of Sage.

CHUSE a piece of ground, the driest and warmest the garden has: in the beginning of April, dig it well up, level it carefully, water it lightly in the morning; and in the evening sow pretty thick the seeds of sage. The common way of raising sage is by slips, but this is vastly preferable. Only take care the seed is good: when the seeds are scattered on the bed, sift over them a quarter of an inch of mould.

When the plants come up, thin them to a foot distance; planting those which are pulled up in another bed, at the same distance. Clear the ground constantly between them, water them frequently, and they will thus

thus produce larger and finer flavoured leaves, than any other way.

The second year leave a few of the finest plants to flower, clear the ground about them, both of weeds, and the sage plants, four foot every way; dig it up to within fifteen inches of each plant all round; break it carefully, and give a plentiful watering. This is to be done when the plants begin to shew their flowers; repeat the watering every other day, to force the flowering, and till the seeds have their full growth; then leave them to harden according to nature. When they are full ripe, pull up the plants; let them lie four or five days in a dry place, then shake out the seeds by striking the plants against the floor; gather up the seeds, spread them for ten days upon a table, in a cool airy room, and they will be fit for putting up.

It will be best to procure the seed for the first sowing in this manner; and afterwards there may easily be kept up a supply. Every year there should be a fresh sowing, and always upon a new spot of ground.

Those who chuse the old way of propagating sage, may do it thus.

In the middle of April dig up a piece of ground that is well shaded from the sun: draw lines on this at five inches distance, and get some good slips or parted roots

of

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of sage; plant these along the lines at four inches distance, and give them a moderate watering: repeat this every third day when rains do not fall, and always keep the ground clear from weeds.

When they have got good root, dig up a large piece of ground in a warm open part of the garden; and draw lines at a foot distance. Take up the young plants, with balls of their own mould about their roots; and plant them carefully a foot asunder in these lines.

Good stout plants may be raised thus; but the leaves will never have that full flavour and freshness or virtue that they have from seed.

C H A P. XXXV.

Of Thyme.

ABOUT the twelfth of March dig up a bed for thyme, in a dry part of the ground, open to the south; level the surface, water it in the morning, and the same evening sow the seeds. Mix them with a little dry mould, and scatter them as evenly as may be over the ground; sift over them about a sixth of an inch of mould; three days after give a little water.

When the plants appear, weed the ground, and when they have a little strength thin them to about ten inches distant: from this time water them frequently; and always keep the ground clean from weeds, the plants will soon be fit for use; and there should be some of the largest and finest constantly left for seed. The ground must be cleared two foot about them, and the seeds when they are ripe saved with due care. Every spring there should be a fresh sowing, for the plants are never so good as when they are young.

Thyme may be propagated by parting the roots; but there is really less trouble, and vastly more advantage, in raising it from seed in this regular manner.

C H A P. XXXVI.

Of Sweet Marjoram.

ABOUT the twentieth of March, dig up a small piece of ground that is open to the south-west, level the surface, water it in the morning; and in the evening sow the seeds of sweet-marjoram not too thick, sift over them a quarter of an inch of dry mould: three days after give a gentle watering.

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When the plants come up, weed the ground, thin them a little, and every other evening water them.

When the young plants are an inch and half high, dig up a larger bed close to the first, mark it out by lines ten inches distant, and in a moist evening remove the plants out of the seed-bed into this, placing them at eight inches distance from one another along all the lines. Water them frequently till they have got good root, and after this keep the ground always clear between them: they will soon be fit for use. It is needless to attempt to save seed, for we have it better from abroad; and it is cheap enough at the seed-shops.

C H A P. XXXVII.

Of Basil.

IN the beginning of March, make up a slight hot bed, by laying up a foot and half thickness of dung, and covering it with six inches of mould. Upon this sow the seeds of basil, and sift over them a third of an inch of the same mould; place hoops over the bed, and draw a mat upon them. Water the bed now and then, and the plants will soon appear; thin them to about three inches asunder, as soon as

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they have a little strength, and by degrees harden them to the air, by keeping off the mats. When they are hardened, and the weather is mild, dig up a bed of earth in a warm and well sheltered place, and in a mild evening remove the plants from the hot bed, into this ground; planting them ten inches asunder. Defend them at first by a reed-hedge, and water them constantly till they are well rooted: after this the ground is to be kept clean between them by hoeing once in three weeks, and they will grow fit for use: they are a capital ingredient in soups; but must be used with moderation.

C H A P. XXXVIII.

OF POT MARJORAM.

Of Pot Marjoram.

IN the middle of March dig up a small piece of ground to the south. Level the surface, and sow the seeds of winter marjoram or pot marjoram pretty thick, and rake them in. When the plants appear weed the ground, and where they have risen too close thin them a little.

When they have got some strength, thin them again, leaving them at eight inches distance: from this time water them frequently, and they will soon grow large.

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they will then require no more care, but keeping the ground clear between them; and as they are wanted, they may be cut for use.

C H A P. XXXIX.

Of Clary.

ABOUT the tenth of April dig up a spot for a seed-bed, open to the south, and near the water; level the surface, and water it moderately. Six hours after rake it over again, and then sow the seed of garden clary not too thick, sift over it a quarter of an inch of mould; and once in three days water the bed, if there be not natural showers.

When the plants rise, weed the ground, a fortnight after thin them to four inches distance, and water them carefully. When they are grown strong enough to bear transplanting, dig up a larger bed in a warm open part of the ground: mark it out by lines two foot and a half asunder, and at every two foot along these lines open a hole. In a moist evening take up the plants from the seed-bed, with some mould about their roots; and carefully set one in each hole. When they are planted, give a moderate watering, from this time hoe the ground

between them as often as weeds appear, and pull off any decayed leaves from the plants. They will spread out in vast broad and fine leaves, which are the valuable part; and these will be fit for use by August, and will continue so through autumn and winter to the following spring. Then the plants will naturally shoot up stalks; a few of the finest must be left for seed, clearing the ground for a yard round them; and these must supply the seed for the following year.

C. H. A. P. LX.

Of Rosemary.

THIS fragrant shrub is best propagated by slips; but they require due care, or they will not succeed: towards the middle of March, dig up a fresh bed not too much exposed to the sun, nor near the water, mark it out in lines four inches distance, and open a small hole at every four inches along the lines; carefully slip off some pieces of rosemary, from a thriving and healthy shrub; plant one in each hole, and close the mould well about them, and give them a careful watering. Defend them by a reed-hedge, and water them often; from time to time clear the weeds away;

away; and with this care they will have got good root by the end of August.

In the beginning of September dig up a very warm and dry piece of ground two spades deep; and work in among it a good quantity of tile-sheds, or small pieces of brick-bats, and fragments of Portland-stone. Cover this mixed earth with about five inches of plain common mould, and then mark out the surface of the bed into lines, of two foot and a half distance: in a very mild evening, that is moist and calm, take up the plants with a good ball of earth, at the root of each, and plant them carefully along the lines at a yard distant from one another.

Water them as soon as they are planted, and repeat it frequently. Shelter them with a reed-hedge, and keep the ground always clear between them; they will the next year be so many good shrubs.

CHAP. LXI.

Of Lavender.

IN the beginning of April, dig up a piece of ground that is well sheltered, tolerably shaded, and draw lines on it at four inches distance. Take off some good slips of the common lavender; plant them immediately

diately at three inches distance along these lines, close the earth about them; and water them frequently.

When they are well rooted, take them up, with good balls of earth; and plant them in a warm spot well dug up, at two foot and a half distance; manage them carefully by weeding and frequent watering in dry weather, and they will in another year make fine plants.

CHAP. LXII.

Of Hyssop.

ABOUT the sixteenth of March, dig up a bed open to the sun, in a dry part of the garden. Level the surface and water it, in the evening rake it over again, and sow the hyssop seed not too thick; lift half an inch of mould over it, and water the bed three days after.

When the plants come up, weed the ground, and gently water them; and from time to time thin them as they gather strength, till they are two foot and a half asunder every way. Then weed the ground when needful, and they will soon grow to their perfection.

Every year carefully select a few plants for seed, and every spring repeat the sowing

in a different piece of ground; for the plants are not so good when they are old.

Hyssop may be propagated by slips as lavender, but this by seed is a far better way.

C H A P. LXII.

THE use of the seed of this is to give a flavour to pickled cucumbers, and it might be extended to many other purposes, for the taste is very agreeable.

THIS plant is so hardy as to need little culture, but a regular sowing and well dug ground makes it much finer, than where it rises in a more random manner.

In the middle of September dig up a bed in the north part of the garden, full two spades deep, level the surface, sow the seeds not too thick, and rake them in.

Keep the ground weeded till the plants appear, then thin them where they stand too close; and from time to time, as they grow stronger, take up more of them, till they are a full yard asunder. thus keep down the weeds by hoeing now and then, and leave the rest to nature.

Let a few good plants stand to seed; and every year repeat this method for the leaves never are so fine as when young.

should begin his plantation by roots, he will do well to have seed as soon as he can for an improvement. The seed of the finest

C H A P. LXIV.

Of Dill.

THE use of the seed of dill is to give a flavour to pickled cucumbers, and it might be extended to many other purposes, for the taste is very agreeable.

The latter end of September dig up a piece of the warmest and driest spot in the garden, level the surface, and sow the seeds of dill not very thick.

When the young plants appear, thin them to a foot and half distance, and weed the ground from time to time: they will then grow to their perfection. When the seeds are half grown, cut off the heads of the plants, for this is the time they are fittest for the service, and leave some of the best for seed the next season.

C H A P. LXV.

Of Asparagus.

THE finest asparagus is to be raised from seed; and tho' the gardener should begin his plantation by roots, he will do well to save seed as soon as he can for an improvement. The seed of the finest

finest plants will produce the finest shoots again; therefore let the plants be marked, while they are in this state of growth.

Look over a thriving asparagus bed, when in full order for cutting, and fix upon a good number of the thickest and roundest heads, such as are juicy, full, tender, and close at the head; place small sticks by these, and mark them as they grow up. If any of them presently spread out at the head, pull up the sticks, and take no farther care of them, but preserve those which keep their firm and close head as they rise.

Thrust in a firm stick a yard and half long by each of these, in the place of the first small stick, and as they grow tie them up in several places to these stakes. The earlier in the season the beds are marked, the better; and there should be twice as many marked at first as are designed to be used, because many of them will turn out bad as they rise; and even of the fine kinds many bear no seed.

Let the marked plants take their growth, and by Michaelmas the berries will be ripe upon them. Cut up the stalk when they are full ripe, and slip off the berries; put a good quantity of them into a wooden vessel of any kind, and let them lie till the skins break, which they will do as soon as they are rotted. Then pour in
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some water upon them, and with a half worn birch-broom strike them gently, and work them about to break them farther: pour off this water with the light hulks, which swim upon it, and put on more; then work the broken berries about with the hands, and the seeds will soon be separated from the pulp, and the rest of the skins; and they will sink to the bottom of the water. Pour off the water, and two or three times wash the seeds with fresh water; then spread them upon a mat, raised above the ground, by nailing the two ends to a couple of tressels; and turn them frequently, till they are perfectly dried. After this spread them on a table, and turn them and move them about every day for ten days; then tie them up in a bag, hang this bag up to the ceiling of a dry room, where there is no fire, and thus let them be kept all winter.

About the tenth of February, chuse out a spot for sowing them. It must be open to the south-west; dig it up one spade deep and no more; level the surface of it perfectly well, breaking all lumps, and in the morning give it a very slight watering. At evening rake it once more with a fine rake, and immediately after scatter on the seeds thin, and as even as can be done: sift over them a quarter of an inch of mould, and leave them

them to shoot. When the young plants appear, thin them in any place where they rise too close to one another; and once in a fortnight weed the ground, water them in dry weather; and thus let them stand the summer.

Toward the end of October the stems will wither: this is a proper time to refresh the ground. Cut them clean off with a sharp scythe close to the ground, and bring on as much compost as will cover the whole bed, three quarters of an inch thick; over this sprinkle a little very old dung from a cucumber or melon bed; and thus leave the ground for winter.

In the following spring, plant them out in this manner. Choose a piece of ground four times as big as the original bed, dig it up two spades deep, and bury in it a large quantity of old rotten dung. This should be thrown in as the ground is dug, and should be a full spade depth under the surface, when the ground is made up. This should be got ready by the 20th of March or thereabout, for that is the time for planting out the asparagus. Lay the surface perfectly level, and mark it out by lines drawn lengthwise half a yard asunder.

Open a trench half a spade deep along the first line, and lay up the mould: then take up some roots to plant in it. This must

must be done with a dung-fork, with the tines somewhat closer than those commonly used for this service. As a labourer takes up the roots carefully and softly with this fork, the gardener should lay them even, and ready for planting. When as many are forked up as will plant the first trench, begin the work: plant them at thirteen inches distance from one another, laying the roots evenly against the back of the trench; then draw in the mould that was thrown up in making the trench, and let it cover the heads of the roots two inches deep. Thus plant four rows of the asparagus, and then leave a space for a walk a yard broad; and from the farther side of this begin as before, and plant four more rows, proceeding thus till the whole bed is planted.

As soon as the asparagus is come up, hoe the ground clean between the rows; and repeat this once in three weeks, always chusing a dry day for the purpose: thus keep the ground clean till autumn. Then observe when the stalks decay; and cut them down with a sharp knife. As they stand in regular rows, this may be done easily; and they should be cut off at about a hand breadth above the surface. When this is done, dig up the spaces left between every four and four rows by way of alley, and throw up as much of the mould upon the
beds

beds as will cover them full half a spade deep. This makes what are called the asparagus beds; and thus are very conspicuous, lying so much above the alley: thus let them lie all winter. In the following spring weed the beds: repeat this as often as there is occasion during summer: and in the beginning of October cut down the stalks of the asparagus, and dig up the alleys, throwing up the earth upon the beds to cover them half a spade's depth higher, as was done the preceding autumn. The next spring is the season when the asparagus should be first cut. Early in February turn up all the surface of the beds with a flat fork made for that purpose, and called the asparagus fork from its use; taking care not to go so deep with it as to hurt the heads of the roots: then rake them level, and once in ten days rake them again till the asparagus shoots up for cutting.

When it is a full hand's-breadth high, cut the largest and finest shoots; but leave all the small ones to grow up to stalk, as they did the preceding year. There is a peculiar knife made for cutting asparagus; it is toothed like a saw: the ground must be opened a little about the shoot that is to be cut, and care taken to cut it off three inches under ground, without hurting such others as may be near it.

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When the spring-asparagus is cut, the bed must be kept weeded at times during summer: and at the time of digging up the alleys in October, lay a coat of old dung from a melon bed, all over the beds of the asparagus, three inches thick; and dig the alleys carefully. Thus the ground must lie all winter, and in spring the fork must be used as before; and so the beds managed every season. The beds will be strong by the following year, and asparagus may be cut from them in considerable quantity, from early spring to the middle of June; then all should be left to run up to stalk; and the same management as before directed should be used, for this and the following seasons.

This is the proper culture of an asparagus bed; and tho' it requires time to come to perfection, the trouble is very little. When it begins to produce, it is very lasting. Such a piece of ground will hold good fifteen years, with the management here directed. If the asparagus is raised from seed without transplanting, which may be done by sowing the trenches, fifteen inches distant, the produce for the two or three first years of bearing, is greater than this way, but it is not lasting; the beds begin to decay about that time, and nothing can recover them. The reason
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of this is, that the roots in this case shoot more perpendicular, and get out of the reach of assistance from culture: whereas in the transplanted asparagus they run more horizontal; and the digging up the alleys is a constant and certain refreshment.

It is a common method to sow onions, upon the asparagus beds when young; and to plant some of the cabbage kinds, or even beans, in the alleys; but this is a very erroneous practice: the crops obtained this way are not nearly of the value of what is lost in the asparagus. We now understand the culture of plants so well, that we know the digging up the alleys furnishes strength to the roots in the beds, by feeding their extreme parts, which run into them. Therefore we know it must be idle to plant another crop in those alleys, which will take up the very nourishment we had thus provided for the plants in the beds. Every thing should grow single in the kitchen-garden, and every crop enjoy the full benefit of the ground wherein it grows.

C H A P. LXVI.

Of Fruits.

THE fruits of a kitchen-garden, exclusive of its wall-trees, are of two very distinct kinds, the pulse and fleshy sorts: the first comprehend beans, pease, and the like, of which we have a vast variety: and under the other head come the melon and cucumber. One general method of culture suits the one of these kinds, and another the other: the first bear the seasons in open air, the others are raised in hot-beds. But the several plants of the same class require so like a culture, that one being perfectly understood, a short explanation will serve for the others.

C H A P. LXVII.

Of Beans.

WE have many kinds of the garden-bean, differing in the length of the stalk, the shape of the pods, the size of the beans, and the time of their coming to ripeness: of all these articles of difference, that of the time of ripening is the most essential

essential, for early crops of an inferior kind are always preferred to those of the finest, which come later.

All these kinds are varieties of the common bean, which owe their difference to culture; and therefore their distinction must be carefully supported by a like culture, or else it will be lost. Gardeners have often found one kind of bean generating into another for want of due care; and the ignorant have often blamed their seedman, when the fault has lain at home. In all cases the finest plants of the kind must be saved for seed; and when the seed has been thus obtained perfect, and cured with the utmost care, it should be changed for the seed of the same kind, preserved as carefully by some gardener at a distance. There is something in this article which is very certain, tho' the cause is not understood. Farmers find the seed of their own ground degenerate, when they sow it there again; and the Patney barley will soon return to the common kind, as one bean to another. This method of changing seed is the great article of preservation; and the intercourse is easy, because both parties are gainers.

As there will be required a succession of beans for the table for several months together, this must be provided for in

time by different sowings; of which the first should be about ten days after Michaelmas, in this manner.

For this purpose chuse the African small bean, and get the seed from abroad. It is called the MAGAZAN; it should be fresh, of the last year's growth, and sweet. Chuse the warmest natural spot in the ground, open to the south, and close under a warm pale or wall; dig up the ground a full spade deep, and draw lines lengthways of the pale or wall, one at a foot from the wall, and two more at two foot from each other.

Throw the seed into a tub of water, and stir it about with a birch-broom, then leave it a few minutes to settle; skim off the beans that swim upon the surface, and immediately drain away the water from the others, and leave them dry.

Open the trenches with a hoe along the lines, and drop in the beans in this manner. Let them always fall in pairs, and each pair at the distance of a foot; and let those of the several rows lie alternately, not over against one another. Cover in the mould, and raise a small ridge over each row of the seed.

Plant a number of stakes on each side of the two outermost rows, at a moderate distance from one another; and thus leave the

the beans to shoot. When they are four inches high, draw up a little earth about their stems; and repeat this as they rise, earthing them up on both sides till there is a considerable high ridge at each row. This will support their stalks to some growth, for they are naturally weak, and are very apt to get harm at the bottom; 'tis also on this part the frost has most power, and the plants are thus protected from it.

When the stalks are a foot high above the top of the ridge, tie a packthread along each side of each of the two outermost rows, fastening it to the several stakes, which were thrust into the ground for that purpose; and in the same manner serve the row that grows next to the wall, by a packthread fastened to the wall at each end. These strings are to be nearly as high as the tops of the beans are at this period of their growth; and they will perfectly secure them from falling down either way. They will thus thrive perfectly well, and will ripen their fruit in the beginning of May. These beans are small, but they are very sweet; the true kind is not larger than the very biggest pease.

A week after the first sowing in October, these should be another; and after this there ought to be four more, once every ten days; therefore the quantity need be but

very small that is sown at each time. This kind of bean blossoms all together, not in succession as the common sorts; and therefore the beans last but a little while. Each sowing will serve for one week, and no more: it will afford three good gatherings, one to be taken every other day. After this the beans will be good for nothing; and the plants should be pulled up, for the seeds they would ripen are of no use: they never yield the same kind again.

The next that are fittest to succeed the African Bean, are the small and large Spanish. The first or small kind is the earliest. A crop of these should be sown between the second and third sowing of the African kind, and another crop between the third and fourth of that bean: these require the same treatment as the other; only if the spot be not exposed to the wind, it need not be dug deep; good earthing of them answering the same purpose. The large Spanish may be sown at a moderate time after the small, and in greater quantities, for it will produce longer; the flowers opening in succession.

The next crop after the large Spanish should be the Sandwich bean; and after this comes the Windsor. This last is without exception the finest of all the bean kind: there is a common kind called
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the Toker, which bears excellently well, and is therefore now common; but it is not so good as the Sandwich; and as it requires to be sown about the same time, there is no reason to use it in gentlemens gardens, who should regard the goodness more than the quantity of the produce. The Windsor bean may be sown about the twentieth of December, or in the first open weather that there is near that time: the other sorts before named will all come in, by various sowings between October and Christmas; and after this the Windsor bean may be sown from time to time, to keep up a succession for the table late in the season.

These late sowings require very little trouble, and therefore 'tis always worth while to do it, for the excellence of the several crops of these beans will depend upon taking them at the exact time, when they are in perfection, and picking out only the best pods at each gathering. This will be easy where there is plenty; and that is as easily provided by these repeated sowings. The beans of this kind are of various degrees of ripeness on the same stalk; and 'tis only at one period they are in their full perfection. Therefore they should be picked and sorted after they are gathered. When the beans have arrived at
their

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their full size, and have stood no longer, they are the sweetest and best-tasted of all, and if only such were sent up to the table, we should have a still higher opinion of this kind than we have, for none is really equal to it. Where there is not the convenience of a wall, for the early beans, a reed-hedge may be set up in a proper place for them: in this case only one row should be raised before it; but when there is a good wall, and the ground is well managed, three rows thrive very well.

The later the beans in general are sown, the less they will want this protection of walls and hedges; and the larger the kind is, and the longer the time of bearing, the greater should be the distance row from row. For this reason the Windsor bean should never be planted nearer than a yard distance, row from row; and by two's at fifteen inches pair from pair. The ground must be always kept clean weeded between them, and in the several hoeings a little mould should always be thrown up to the stalks, so as to make a kind of slight ridge for them. In very dry seasons they will be greatly assisted by a little watering.

From time to time pull up all the weak suckers which rise by the main stalks, and a week after the plants have begun to flower, their tops should be nipp'd off, to prevent
their

their spending themselves in more growth upwards.

In the choice of ground it should be proportioned to their growth; the earliest crops do best in a dry, light, and warm soil; but the latter require it to be somewhat tougher and moister. It will be a very good method in our way of disposing a garden, to allow one or more entire beds for beans, and to begin the earliest sowing at the head, and the succeeding lower and lower down, till the last come to the edge of the walk round the pond. This will be very easy, and will suit the plants.

All the kinds except the first may be raised from seed, and at home; and for this purpose there should be always some of the finest plants of each kind reserved. These must be kept for seed only, no part of the pods being gathered for the table: the ground should be dug up between the rows, and on the outsides of them, when they are about to flower; and they should have frequent waterings, while the pods are swelling. After this they should have none, that the seeds may harden leisurely. Only the pods of the lower part of the stalks should be saved for seed, the rest thrown away; and it should be a rule never to let two kinds of bean stand together for seed, because they will spoil one another. With these

these cautions the seed of each kind will be raised perfect, and the kinds kept entire; and by a change between one garden and another, there will be so far from any degeneracy of one kind into another, that they will constantly improve.

Beside the kinds named above, there is now just getting into repute a dwarf kind; it is a middle-sized and a well-tasted bean; the stalk is very short, not above eight inches from the ground, and the quantity of pods they produce is very surprising; no particular directions are necessary for raising these, they are to be managed as others; and all the care required is to get right seed, and plant them about half an inch deeper than the other sorts.

C H. A P. LXVIII.

Of Pease.

WE have the same variety of pease, nearly that there are of beans; and, like those, they arise from one common stock: this is the common white pea. A long continued attention to the culture of these plants, and the proper care of selecting the best for seed, and pulling up all that are the least inferior from among them before they flower, has from time to time
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more and more improved the several kinds; and we are yet every year improving them farther; not only raising them to a greater excellence, but bringing them into season earlier.

The time of their coming into use depends upon that of their sowings, and on the choice of a right kind, and proper culture: these three articles we shall particularly direct, first for the earlier, and then for the later pease; and they will be easy.

The first pea which ripens in the open ground is the hot-spur; this is to be sown for that purpose in autumn, and treated as the bean. There are several distinctions of the hot-spur pea; and good gardeners, by careful ripening of the seed, and exchanging with one another, are improving even the best of these yet farther; so that we must yearly expect new kinds. At present the golden hot-spur is the best, and next what the seedsmen call the Charlton; therefore none but these should be used, and of these only the golden, where it can be had good.

About the twenty-third of October, dig up a warm bed open to the south, and sheltered behind by a wall, pales, or reed-hedge: open trenches along this ground; the first one foot from the wall

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or pale, the other two foot from that; get good seed, and open the pease in pairs, at the distance of five inches pair from pair; and draw the mould over them, that they may be covered three quarters of an inch.

When the young plants appear, weed the ground by hand; and it will require no more of that trouble till spring: as they advance in heighth, hoe the ground between the rows, and draw up some of the finest mould about their stems on each side; repeat this occasionally as they rise in length, and this is all the care they want in winter.

In spring weed the ground carefully from time to time; and if there be slugs about, strew some lime new slaked all over the ground, between the rows: in a dry day once more draw up a little earth about their stems, and thus prepare them for blowing. If the season should be very severe at any part of the winter, a little clean dry straw may be strewed over the ground, and taken off again when it is milder.

Three more sowings of these pease should be made in autumn; and the plants all treated in the same manner; the second should be about the last day of October, the third on the eighth of November, and the last of these about the eighteenth of

that month : all these are to be treated as directed for the first.

The next must be the spring-sowings : these should begin early in January ; the same kind of pea, the golden hot-spur, is the best of all for the purpose ; one parcel of these should be sown about the fifth of January, and a second about the sixteenth, and a third about the eight and twentieth.

These will naturally follow the plants of the autumn-sowings in bearing ; and if one crop of either of the autumn or spring sowings fail, another will have its chance to succeed. There is no more real trouble in sowing a certain quantity of pease in this manner at seven times, than all at once, for 'tis but a seventh part of the labour, and time that would be required for the whole, which is allowed to each part ; and the success is certain in this way, from one part or other ; whereas the chance of any single early crop is very uncertain.

After these are in the ground we are to take care for a succession later in the year ; and this must be by a well-timed sowing of the right kinds.

The Spanish moratto should be the next kind of pea. This requires no particular shelter ; dig up a bed about the sixteenth of February, and draw lines a yard asunder ; get good seed of this kind, and opening furrows

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furrows along the lines, drop in the pease in pairs, about four inches pair from pair. Cover them an inch and half deep with mould, and thus leave them.

The last day of February, sow another crop of these pease in the same manner.

About the fifteenth of March, sow some of the sugar-pea, in the same manner, and at the end of the same month a crop of the fickle pea. Then in the second week in April, sow a bed of marrow-fats, and at the end of that month another of the rouncival; in the first week of May, sow another bed of marrow-fats, and about the twelfth of the same month another of rouncivals; and this compleats the pea-crops. There will be thus a succession of pease all of good kinds, from the very beginning of summer to michaelmas.

All the late pease are large growers; and if they have not air and distance, will run up to stalk, and bear little fruit. The rows of them should be four foot and a half asunder; and the pease should be dropped by pairs at a foot distance in the rows.

When the plants appear, the ground must be hoed, and a little of the fine mould drawn up to their stems; when they are half a foot high, some boughs, with all the twigs upon them, should be stuck into

into the ground, for them to climb upon. The earliest crops should have the driest part of the beds; and those sown later should have such ground as either is in itself moister, or can be conveniently and easily watered. This points out the same conduct that we directed for beans; which is, that the earlier sowing should be at the heads of the south beds; and the latter in succession, down lower towards the pond.

The early crops produce less than late and large kinds, but the pease are much sweeter; a great deal of attention should be shewn to the gathering of these at a proper degree of ripeness, and the stalks pulled up as soon as all are gathered; except such as are to stand for seed. The best way for nice tables, is to gather the large pease very young, for otherwise they are not so sweet. After all our new kinds, the old English rouncival is the very best of the late pease; and by careful management it will yield crops till the end of September.

Pease may be forwarded by a hot-bed in spring, so as to come in yet considerably earlier than any in the open ground; and as there is little trouble in this, a good garden should not be without the advantage. The pease for this service are not

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to be sown in a hot-bed; but in the common earth in October, and to be planted in the hot-bed early in spring. Any of the pea-crops of the October sowing, may be taken up for this purpose; but 'tis best to think of it in time, and sow some purposely. There is for this use a dwarf pea, as there is a dwarf bean; and the lowness of its stalk makes it much fitter for covering with the hot-bed frame. Therefore, about the eighteenth of October, sow some of this dwarf pea under a warm wall as the hot-spur, and manage the crop thro' the winter in the same manner, earthing up the stems in dry weather, and defending the plants against extreme frost, by strewing some clean straw over them.

About the fourth of February prepare the hot-bed: this must be made of fresh dung, that has lain a week to heat; it must be laid two foot thick in the bed, and well smoothed, and beat together. Cover this with a full spades depth of mould. When this is laid even, put on the hot-bed frame, and leave the whole three days to heat, and mellow together under cover of the glasses. The frames should be two foot high behind, and fifteen inches in front. The glasses should be shut down close the first day to heat the mould; then they must be raised with brick-bats, and the

the steam let out. Thus on the fourth day the bed will be in perfect readiness for the plants; then draw lines lengthway of the hot-bod at two foot distance from one another; take up the plants with good balls of earth, and plant them in these rows as close as they will stand, making the ball taken up with one root touch that taken up with another. Gather the mould close about them, and water them gently.

Put down the glasses, and lay mats over them; and keep them thus close and shaded till they have taken new root. Then water them every day, but a very little at a time; and keep the glasses shut down in the night, but raise them up in the middle of the day; and if at any time the sun shines fiercely upon them, draw a mat over the glasses. This is the whole management, and while the plants are thus watered lightly, but often; defended against the night frosts and scorching sun, and hardened to the air as much as the season will admit, by raising the glasses at proper hours, they will grow fast, and soon come into bloom; and the produce will be very considerable for that of plants raised this way.

As they grow up in height, the earth must be drawn up about their stalks, and at all times the bed must be kept perfectly clean from weeds; when the pods begin

to shew themselves, the watering must be larger, and thus they will go through their bearing season without accidents.

All that remains of this article is, to manage some of the best kinds, and best plants of these kinds for seed; this must be done with the same care we have directed for the beans; and indeed the gardener when he lets either the hotspur, or late kinds, stand for this service, should be as careful not to suffer one bad plant among them, as the florist is in his feeding stocks.

Some of the best rows must be set apart at first for this purpose, and no pease must be gathered for the table from these plants; they must stand till the pods begin to burst, and then be pulled up. They must be laid in an airy place, and turned every day; and when the whole plants are well dried, they must be thrashed out; after this the clear pease must be spread upon the floor, and turned and sifted every day for a fortnight; and when they are thus thoroughly hardened, they should be put up in large paper-bags, and hung to lines from the ceiling. These seed the gardener should change with some friend at a distance, who saves his with the same care, and then both will from year to year improve their stocks.

C H A P. LXIX.

Of Kidney Beans.

THE kidney bean, which it has been now long a custom to call the French bean, is very much of the nature of the preceding kinds as to its culture; and will be raised to full perfection by the same care. Culture has extremely improved and varied this as well as the others; and we have many distinct kinds for the table. These may be properly arranged under two general heads, the smaller and the larger: the smaller are the earlier; but the larger are the better bearers.

We have three small kinds fit for early service; these are the white dwarf, the liver coloured dwarf, and the negro, or black dwarf. These have the advantage of ripening early; and they are so low in growth, that they may very well be kept on hot-beds under frames; but they are not comparable to the larger kinds in flavour, when these grow free, and have air enough, and good management.

The dwarf kidney beans may be raised either naturally, as the early pea and bean kinds, by sowing them in good time under warm walls and pales; or forced by dung

and frames, or in stoves : the last method gives them at a time, which makes them extremely valued ; but even in the natural ground they will come in three weeks before the others, which renders them very valuable.

The hardiest of the kidney beans are so much tenderer than the pea or bean kinds, that there can be no thought of putting them into the ground in autumn, nor indeed before the spring frosts are over. The way to have them early is to sow them on a hot-bed, under a frame in March, or upon a slighter hot-bed hooped over, in the very beginning of April : this is a fortnight earlier than they can be ventured in the open ground ; and the quick growth the hot-bed will give them at first, will add to their early time, in comparison of the others, tho' they are to be planted out into the open ground afterwards.

We shall consider the culture of the kidney beans therefore under these three heads ; first those which are raised on regular hot-beds, and kept to fruit under frames ; secondly, those raised on slighter hot-beds and afterwards planted out into beds ; and lastly, those sown in the open ground.

For the first purpose the white dwarf is the best ; the black has usually been found
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to be fittest for the second way of raising, because it bears transplanting better than the liver coloured; otherwise they are upon an equality in this respect: finally, for sowing in the open ground, we have four kinds, the Battersea and Canterbury, the scarlet and Dutch. The two first are earlier than the others, and properly follow the dwarf kinds; the Dutch is an excellent bearer, but the scarlet is the best flavoured of them all.

For the earliest crop of kidney beans, prepare a hot-bed about the middle of February, laying the dung two foot and a half thick, and the mould at least eight inches. When this has lain about four days, and the mould is warm, and the rank steam is gone off, draw lines along the bed two and twenty inches asunder, and open trenches along them, drop in the seeds in pairs, at about three inches pair from pair, and cover them half an inch with mould; put down the glasses as soon as they are sown, and only open them a little in the middle of the day till the plants come up; then they must by degrees be opened higher and left open longer, taking care not to chill the plants. This must be continued all the time of their growth, for it will prevent them from running up weak, and will occasion them to bear a great deal of fruit.

As they rise in height the earth must be drawn up about their stems; and they must have at times moderate waterings, No weeds must ever be suffered upon the ground. When they come into flower, they must have more air; and the glasses must be covered when the sun shines fiercely. The warmer the season proves, the more the glasses must be raised; for the greater quantity of air they have, the less they will be drawn up in height, and the greater will be the produce of fruit. When they are first in blossom, they must have very little water; when the pods form themselves, they must allowed more; and as fast as these become fit for service, they must be pulled. This is the method to have them delicate, and for a considerable succession for a thing of this kind.

The second method of raising early French beans, is by sowing them on a hot-bed, and planting them out in the open ground when fit for removal. This is the most commodious way: and this will bring them in considerably earlier than those sown in the open ground. About the twenty-third of March make up a hot-bed with two foot thickness of dung, and eight inches of mould. Draw lines along this at five inches asunder; and drop in the seeds in pairs at four inches distance pair from pair;

pair; draw the mould over these to cover them three quarters of an inch; place hoops over the bed, and draw some matting over them to shelter the bed.

When the plants appear give them from time to time slight waterings; and by degrees inure them to the air, by raising the mat more and more in the heat of the day.

When the plants have got their proper leaves, beside the two seed-leaves, which first rise, they will be fit for transplanting. Dig up a warm bed under a south wall, or defended by a pale or hedge in the same direction. Draw lines along this at thirty inches distance; and open a hole at every six inches in these lines, for the reception of one of the plants. Take them up in a mild afternoon, and take a good ball of earth with each, plant them carefully, and give them a gentle watering. Repeat this every day till they are very well rooted; and if from severe frosts or scorching sun at noon, there appears any danger of their not succeeding, fasten a mat to the wall or other shelter, and draw it over them occasionally till they are rooted. After this the ground must be kept well hoed to clear it from weeds, and the plants must be watered from time to time. They will thrive full as well as if originally sown where they stand, and bear their fruit much earlier.

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The French beans for the common ground are the next care, and these are to be sown at different seasons to keep up a succession: the first crop cannot be ventured into the ground till the twentieth of April. A very warm and well sheltered bed must be dug up for these under a south wall or reed hedge. The mould must be very carefully broke; and there must be two lines drawn along it at a yard distance. Open large furrows with a hoe along these lines, and drop in the seeds in pairs about a fingers length pair from pair. Cover them up, and keep the bed weeded. After this a fresh crop should be put into the ground every fortnight till the beginning of June; and all are to be treated alike: good hoeing is to be allowed the ground to destroy all weeds, and break the soil; and in very dry seasons they must have now and then a little water. In hoeing the ground some of the finest of the mould should always be drawn up to the stems; and the fruit of the several crops should always be gathered as soon as fit for use, because this occasions a succession. From these several sowings the table will be supplied from the very beginning of summer till the frosts kill the last plants.

For seed there should always be left some rows of the very finest plants, and from these

these no part of the fruit should be gathered for the table. These must stand till the beans are thoroughly ripe in their pods, and the plants must then be pulled up by the roots and thrown on the floor of an airy room to dry. They must be turned every day till thoroughly dried, and then the seeds beat out. These must be spread again upon the floor; and turned frequently till they are hardened; and they should then be put up dry; and exchanged with some honest and careful person at a distance, who has saved his in the same manner.

C H A P. LXX.

Of Artichoaks

WE see occasionally two kinds of artichoaks, the common or brown, and the smaller or green artichoak. The former is the common kind, and most preferred, as larger and more fleshy at the bottom of the scales; the other is more delicate, having something of a musky flavour, like what we sometimes find in the cabbage, but vastly finer. When this kind is raised with a great deal of dung, the flavour becomes coarse, and this has put it out of repute; but when it is more carefully raised, tho' the bottoms of the scales have

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have less out of them, the delicacy of what there is makes very good amends for the deficiency of quantity. The same culture serves for either kind.

The artich oak is a plant of the thistle kind, but with vast and fleshy scales to the head, which we have also improved and enlarged still more by culture. It encreases fast at the root, in the manner of many of the perennial thistles; and it is therefore easy to propagate the plant by these, without farther trouble.

About the fifth of March, if the season be moderate, open the ground about some old artich oak plants, in a mild evening: this may be done in the end of February, or, if the weather be still very sharp, in the beginning of March, it must be deferred a week longer. Throw off the mould carefully from about the old plants, not to hurt the shoots, and clear them below the place where these rise.

Chuse the two best and most promising shoots which rise from the lower part of the old root, to leave for the next season's produce from the old root; and take care not to wound or injure these: then force off very carefully all the buds and other shoots from the head of the roots, and chuse the fairest and best of these for a new plantation. The clearing off the buds and shoots is necessary
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for the good of the old plants, which, when thus dressed, are to be covered in again with care, keeping the two shoots that are left as distant as can be without violence to them, and thus leaving them to their growth for summer fruit.

In chusing of the shoots for the new plantation, take only such as are tender, not sticky or stringy, and have a good head and some fibres hanging to them. Dig up a piece of ground for these, two spades deep, and bury at the bottom half a foot thickness of old rotten dung, draw lines along this at five foot distance from one another; and at every two foot along each line make a mark for receiving a plant. When all is in this readiness, trim the shoots that are to be planted first, cut off the part where they grow to the old root; then trim away the outside leaves, and let the head or bud stand clear. As the roots are trimmed set them in a shallow tub of water, and when all is ready begin the plantation, by opening a hole a spade deep at each mark, and in this set one of the shoots: let it go four inches deep in the ground, and close the mould very well about it. In this manner plant the whole number; then give them a good watering; and repeat this carefully every day till the plants are well rooted, and shew fair signs
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of growth. From time to time weed the bed, not only in the broad intervals between the rows, but between plant and plant in each row.

In the beginning of May dig up the earth in the intervals, and break it well: this will give a fresh life and vigour to the plants, and make them certain to produce fruit the same summer. After this they will only require weeding, till the young fruit appears; then let the ground be dug up again between the rows with a spade. Let not the labour be grudged, for it will be very well recompensed in the excellence of the fruit. When the produce of the old plants is going off, these new ones will shew theirs, the fruit will ripen in September, and will be larger, fairer, and better flavoured than that from the old plants. It is become a custom to neglect the green or French artichok; but if some of that kind be thus raised, they will be found worth more regard.

When these new plants have fruited, they are to be treated in all respects as the stocks or roots from which they were raised; and the method is this. Toward the beginning of November look over the bed from whence the artichoks have been cut, and where any new shoots are risen cut them down close to the ground: then dig up the whole bed,

bed, but without disturbing the roots of the artichokes. Throw up the mould each way in a ridge to each row of the plants, so that every row may be in the very middle of a ridge: this will strengthen the roots during winter, prevent the hasty growth of shoots, and preserve the plants from the frost, which is sometimes entirely destructive of them. If the winter be severe, lay a quantity of pease-straw over each ridge to preserve them the more securely, and let it lie on till the beginning of February, but no longer. Toward the latter end of that month the plants will be growing through the ridges, and they are to have the spring dressing just as the old stocks: the mould must be cleared away that the shoots may be examined, the two best must be preserved for each root, and the rest rubbed off. These two must be parted as wide as can be without tearing them at the root, and the earth well gathered about them. At this time some of the best of the other shoots must be taken up for a new plantation, and then all is to proceed as in the former year. When the plants have set for fruit, all suckers from the root, and shoots from the stem, must be cut off, that only one good fruit may be left upon each stem. When these are fit to cut, the plants must be taken off close to the ground; and thus remain

remain till they earthed up in November. Every spring some of the best shoots should be saved at the dressing for a new plantation, for the sake of having late fruit; and from time to time, as there is a continual encrease, the worst of the roots are to be destroyed.

It is a custom in the common gardens to raise crops of other plants between the rows of artichokes; and where gardening is carried on as a trade, it may be right; but the gentleman, who values the quality of his produce, should never suffer any more than one crop upon one piece of ground.

C H A P. LXXI.

Of Cucumbers.

OF the fruit of the kitchen-garden, the first that requires hot-beds, is naturally the cucumber; and when they are understood for these, it will be easy to make them for every other kind of product which requires that assistance; and to manage the several sorts. In order to raise cucumbers properly, the first consideration is the making a succession of hot-beds, first smaller and then large, which is to be done thus.

Bring out a quantity of long dung from the stable, with as much of the urine as will

will hang about it, and all the real dung without water : sift up a heap of ashes from coal cinders, and lay it near the place where the dung is to be made up into its first heap. This should be in a part of the enclosed ground about the kitchen-garden, and just before the stable door. Begin the heap by laying a small bed of dung, then throw some of the coal-ashes carefully over it : the bed of dung should be half a foot thick, and the quantity of coal-ashes about as much as would cover it half an inch. Lay these even ; then let one person wheel the dung from the stable to add to this heap, and another scatter in some of the ashes among it as it is thrown on the heap. Continue this addition to the bed till there is about the quantity of two load of dung, if it has been carted ; when the heap is made up, leave it a week, then carefully throw it to a small distance, making it up into a new heap, but without any more ashes. Let it lie in this new heap five days, and then wheel it into the kitchen-garden.

Mark out a piece of ground in the warmest and driest part of the garden for the first hot-bed, which is to be very small, and only for the shooting of the seeds : open a trench for it a full spade deep, and five foot and a half broad ; the length to be

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according to the number of frames, but usually two are sufficient for this purpose.

Throw out the mould from this trench; and strew over the surface an inch deep of the cinders, from which the ashes were sifted. Then throw in the dung, make the whole length of the bed at once, and use a pitch-fork for the dung, that has wide tines; by this means the long stuff will be thrown in first, and the small and rich dung left to cover the surface, last of all.

Lay the dung even as it is thrown in; and when this last part is swept up and spread over it, then marking the places where the two lights are to come, throw on a full barrow of fine mould in the place which will be the middle of each light; and cover the rest of the bed only about four inches thick.

Fill some small pots with very fine mould, and set them up to the rim, in this part of the bed, which is thickest covered; let them stand thus till the mould in them is warmed; and then sow some of the cucumber seeds in them. As soon as these pots are put into the mould, the frames must be put on, and the glasses covered down, only opening them a little occasionally to let out the great steam.

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The choice and care of seed is a very great article in this respect; and comes properly here under consideration. In the first place we have our choice of several kinds of cucumbers, whose different natures should be well understood before we fix a choice. 1. The common cucumber: This is of moderate length, rough on the surface, and in colour partly green, and partly white: this is for many reasons to be preferred to the others, being hardier, firmer, and better tasted. 2. The Turkey cucumber: this is long shaped, perfectly smooth on the surface, and quite white. 3. The Dutch white cucumber: this is of a middle nature between the common and Turkey kinds, being long and white like the Turkey cucumber, but rough on the surface like the common kind. This would be preferable to the two others, but that the plants are tenderer and more subject to accidents. Fancy may give the preference to the Turkey against the common cucumber; but it is a false taste, and, like that which gives preference to the scarlet radish above the purple, is founded on novelty only, not on excellence.

Whatever kind be chosen, the seeds shou'd be at least two years old, and such as have been kept in a dry place; if they be older, and have been carefully kept, the

better. They shou'd be the seeds of some of the first cucumbers, that have grown upon thriving plants, and have been saved for that purpose before any were gathered. It is in this, as in all other instances; the gardener who wou'd succeed well must begin with early care.

When the small hot-bed just described has been shut down with the pots of mould in it plunged to their rim, in its own shallow covering, two days and a night, the mould will be warmed sufficiently in those pots to receive the seed. This must be sown on the surface, and covered half an inch with some mould from the bed; and the pots must be a little raised in the mould, and a kind of circle of mould made round their edges. In about eight days the plants will appear; and if the bed has been well made and rightly managed, by keeping the glasses down, except opening them a little to let out the steam, the mould in the heap will be all this time coming to its necessary warmth and mellowness; and it must be now spread over the whole bed, and the pots raised so as to keep their rim level with the surface.

As soon as the plants appear, fill some more small pots with mould, and set them up to the rim in the mould of the hot-bed as before. There shou'd be as many
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of these as there are intended to be plants raised. They are to stand here, to have the mould in them warm; and as soon as the young plants in the first pots have got their two first leaves a little open, they are to be transplanted into these.

They must be taken up with care, and three shou'd be planted in each new pot. The glasses must be kept close, and a mat laid over them to shade the bed till these are well rooted again; and thus they are to stand three days, to see which are the most promising. Then two of the three in each pot must be pulled up, leaving only the best plant in each.

These plants must be carefully watered from time to time: it must be done at least once in the four and twenty hours, but the quantity each time must be but little, and the water must stand in the hot-bed to be warmed three or four hours, before it is used. Once at least every day the glasses must be raised to wipe them, that the steam, which has concentered into drops, may not fall back upon the plants.

When the plants are removed from the first into the second pots, fresh dung must be laid round the bottom of the hot-bed, and piled up as high as the dung. It shou'd be about foot thickness, and beat close: this will give a new warmth to the

bed, just when it will be wanted, to push the plants after their removal into the new pots.

The latter end of January is the best season for making these first hot-beds, and if the plants are well managed in them, the fruit will be as early ripe as any one can naturally desire.

The plants may stand in this bed till toward the latter end of February, and then a fresh hot-bed must be made for them. This shou'd be one third larger than the first, and made exactly in the same manner. The dung must be laid even and beat down, and covered with the frames, three of which will now be required. Thus it is to lie three days before the mould is put upon it; and at the end of that time it is to be covered with five inches thickness of common mould.

A number of pots somewhat larger than the former must be provided, and filled with the same fine mould. There must be as many of these as of the others, and must be in the same manner let in up to the rim in the mould of the hot-bed. When these pots and the earth in them are well warmed, the plants are to be carefully removed into them.

This must be done by turning out the whole ball of earth from each small pot,
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with the young plant in it, and in this manner planting it in the fresh one, taking out as much of the mould from each of these larger pots, as will allow room for the whole ball of earth, from the smaller: Let this in without breaking, and fill in the sides with a little of the warm mould; water the plants a little, and then close down the glasses; and after a few hours open them a little, to let out the steam. Lift up the glasses, and turn them every day, before and after noon; and after four and twenty hours raise the pots a little, to keep the dung from heating their bottoms too violently.

Every night draw mats over the glasses, and keep them shut down all the cold part of the day; whenever they are raised a little to let in fresh air, or to let out the steam, let it be done in that part opposite to where the wind comes. Whenever the glasses are raised, hang a piece of mat over the opening: it will admit air enough, and let out the steam without absolutely starving the plants.

When they have stood three weeks in this bed, they will be fit for to plant out into the third or last hot-bed, in which they are to produce their fruit.

This must be made in the same manner exactly as the former, only that it must be a great deal larger. This extent

must be in length; for the breadth must be the same as in the small ones, that the same depth of frames may cover it, and it may be easily and conveniently managed.

The quantity of plants thus raised will very well furnish a bed so large as to require twelve lights or frames, and therefore more or less may be done at every one's pleasure.

The quantity of dung of this great bed is to be measured by the number of lights: there shou'd be a good cart load of dung for each.

The trench for this must be open as in the smaller, and the dung laid in after the same manner. When this is laid and levelled with the pure or small stuff at top, lay over it as much old cow-dung as will cover it about an inch, and thus let it lie to warm, with the glasses down.

Three days after lay on the mould, cover the whole bed two inches and a half thick, and all along the middle of the bed lay on an inch thickness and more of the same mould, which must be mellow, very fine, and dry.

Let the bed lie four and twenty hours after this mould is on, and then bring in the plants, shake them carefully out of their pots, with the whole ball of earth; and place three under each light: they must all stand strait along the middle of the
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the thick coat of earth, that is, on the middle of the bed. One must be placed in the middle of the frame, and the others on each side, at equal distance from the middle plant, and from the edges of the frame. The balls of earth taken from out the pots are to be placed upright upon the surface of the bed, without breaking them; and the mould is then to be gather'd up in a hill round about each ball; and thus every plant will appear to grow upon the top of a rising in the bed; the roots soon uniting the earth of their original ball, and the rest. They must after this be watered from time to time, with water that has stood in the hot-bed some hours, and from time to time also the glassess must be raised in the middle of the day, to let in a little air thro' a mat, as before. Every night they must be shut down; and covered up with mats to keep in and preserve the heat.

The plants will grow apace under this management; and by degrees more mould must be laid upon the thinnest covered parts of the bed, till a little warmed, and then gather'd up round the hills in which the plants grow.

They must be watered lightly and often; and this addition of earth repeated till the whole bed is covered a foot thick with mould.

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The plants will soon shoot out side-branches; and these, as soon as they have a little length, must be laid in the direction wherein it is designed they shou'd run, and pegg'd down to the bed. They must be laid so as to run free from one another, and as near as may be at equal distances from each other. As they grow longer they must be pegg'd down a second and a third time, and thus kept in their right places.

When the flowers appear, there must be more care taken to let in fresh air at due times, and the waterings must be regular, and somewhat encreased. A few days after the plants beginning to flower, a quantity of new dung must be laid up all along the sides of the bed, to give a new warmth for the fixing and right setting of the fruit. When the flowers are opened, it will be easily seen that there are some male and others female: the female flowers have a fruit under them, but the male have none. The male flowers must be one by one cropped off when full blown, and turned down bottom upwards upon the female; and while they lie thus, they must be gently struck on the outside: this shakes off a fine yellow dust from the antheræ of the

the male flower, which inpregnates the female.

Before this method was invented, great numbers of the female flowers failed or produced no fruit: now there is not one in a thousand but succeeds.

When the fruit is once set, it grows apace, and there will in a very few days after be some to gather: the bed in the usual way continues bearing several weeks, and then the plants die: but if there be fresh dung added to the sides to keep up the warmth, and fresh earth laid upon that, the frames being raised as the mould is raised about them, but with care to keep them well closed in with mould at the bottom, these beds will hold good, and the plants keep in bearing the whole summer.

The time to enlarge the bed in this manner, is soon after the first fruit are ripe enough to gather. The fresh dung should be pil'd up two foot thick on each side of the bed, so as to bring it to nine foot broad in the whole; and the top of this, tho' on the outside of the frames, must be covered with mould of the same thickness with the other part that is within. The roots of the plants will extend into this; and they will by this means support and feed them fully, while the natural
heat

heat of the air at the advanced period of the year that comes on upon their late growth, will supply the deficiency of heat in the bed.

The method here given will therefore with good management supply a family the whole season that cucumbers can be wanted, without any other help; but as there are different methods of propagating them, for the yet earlier as well as for somewhat later seasons, we shall here lay them down: intending to render this work as compleat as is in our power. Where there is the advantage of a stove for pines or foreign plants, there may be earlier cucumbers than those we have mentioned. The seed for this purpose should be sown the beginning of December, in small pots, and these set up to the rim in the bark in the stove. When the plants come up, they must be watered a little; then they must be transplanted into other pots, when they are a little grown; and a third time from these into such as are yet larger. All this will be done in a very moderate compass of time, for the growth is very quick in stoves.

After this they may be kept there to fruit, if that be convenient; or otherwise removed to a common hot-bed, as we have directed for the last plantation of the others; and in either case they will be
much

much earlier than those raised without the help of stoves.

As to the latter cucumbers, they are raised under bell-glasses; and there is no recommendation for this method, except that it has less trouble than the other.

It is to be done thus. About the eighteenth of March, sow some seed of cucumbers upon the hot-bed, where the early plants are growing: in about nine days it will come up, then make a small hot-bed for receiving the plants in the same way as before directed. When this is in a proper temper of heat, and the plants have got their two first leaves full expanded, carefully take them up, and plant them in this second hot-bed, cover it with a frame, and shut down the glasses. Let the plants be watered moderately, and shaded with a mat in the middle of the day, till they are well rooted, defend them in the night by drawing the mat over the glasses, and in the warm part of the day let in a little air. About the twentieth of April they will be fit for transplanting to the bed where they are to remain: this is to be a hot-bed without frames, or a ridge of dung, covered with mould, in certain places where the plants are to grow; and upon which bell-glasses, or those made for the hand by glaziers,

glaziers, answer all the same purposes of the frames and lights, in the other.

Each cart load of dung will serve for five holes, or places of planting in this method: therefore the quantity that will be wanted is easily known.

Lay it up in a heap fresh from the stable, with some ashes intermixed, as for other hot-beds: when it is of a due temper, which will be in about eight days, open the trench for it. This should be only three quarters of a yard wide, and dig out the mould a full spade deep: the length must be proportioned to the number of plants to be raised, lay in the dung with the same regularity as in other hot-beds, and measuring out the length of this ridge or narrow hot-bed, open a hole in the middle of it at every yard and quarter by measure.

These holes must be a quarter of a yard over, round, and six inches deep; fill these holes with fine mould, and then cover the rest of the ridge a hand's breadth deep, with the same mould that was thrown up in digging the trench for it, and lay some of it on each side of the dung; sloping down to the level of the ground. The plants are to grow in these holes, and the branches to spread over the rest of the ridge, and over the ground on each side; so that if two or more ridges be made, either for
quantity

quantity or convenience, they ought to be two yards and a half from one another.

When the ridge is covered, level the surface of the mould, and place a glass over each of the holes, pressing its edges firm into the mould; thus let it stand thirty hours, and the earth under it will then be warm enough for the plants.

Take them up with care from the former bed, and plant in each hole four of them at equal distances; first hollowing the mould a little to the shape of the hole before it was filled with it.

Fix the mould well to the plants, give them a gentle watering; and whelm down the glasses over them. Shade them with any light covering till the plants are well rooted; and then every day till toward noon raise the cover a little on one side, where it may be done securest from the wind.

Thus keep them lightly watered, and close shut down at night; but give them more and more air in the warm part of the day, till they are grown so large to fill the glasses, then raise the glasses on brick-bats, but still keep them over the plants till about the third of June, at which time they may be safely raised up, entirely to such a height as to let the plants out of them, only keeping the glass over the part where the roots are at eight or ten inches height.

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In a moist day, when plants are more tractable than in the scorching sun, lay the branches of the several plants upon the surface of the ridge, in the way they are designed, to run at equal distances from one another. A fortnight after this dig up the ground a spade deep on each side of the ridge, for a yard in breadth: level the surface, and lay the branches as they run regularly upon it.

They will by this time begin to bear fruit; and they must be watered at times, and the branches as they run, must again and again be laid even and pegg'd down, to keep them in their places. The space between must be kept clear from weeds, and they will require no more care; but will bear abundantly, full as long as cucumbers are fit for eating, for towards autumn they grow unwholesome.

The last or hardiest crop of cucumbers are those raised absolutely in the open ground; and these are what we principally use for pickling. About the twenty-eighth of May, chuse a warm spot of the kitchen-garden, dig it up a full spade and half deep, and open the holes in each like a small basin, at a yard and half distance from one another; in each hole sow about a dozen seeds of cucumbers, and cover them half an inch. If there fall no rain in three days,

days, give them a gentle watering, and then lay a piece of furze-bush or black-thorn over the hole, to keep the ground a little shaded, and prevent birds from spoiling the crop.

In a week from the sowing, the plants will be up.

When they are grown to a third leaf, pull up all but the three best in each ball, and draw up the mould about the stalks, pressing it against them in such a manner as to give them a tendency to spread outwards. Then water them again from time to time, and draw up the mould about each hole, to make the basin deeper, for the reception and detaining of water.

Lay the branches of the plants regularly upon the ground, and peg them down to keep them in their places; then cover the ground, and from time to time repeat the waterings.

At the very beginning of August these plants will begin to produce fruit; and it should be gathered young for pickling; but if some are left to stand till they are of nearly the common size for eating raw, they will be found very well tasted.

Thus are the several crops of cucumbers to be managed for the table; but there yet remains the article of sowing the seed, which is not less important in this than

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other

crops. There is not the same necessity of changing the seed from time to time, in regard of this plant, as there is in the generality of those which grow in the open ground; because the bed being made entirely fresh every time, has sufficient difference. Therefore the gardener has the more reason to be careful in sowing the seed, because he is certain to reap the fruit of his care.

The cucumber-seed for each crop should be sowed from a plant of that crop; and always in this manner.

When the plants first set for fruit, observe which is the strongest rooted, then fix upon the stoutest branch of this; and observe, when the young fruit first appears, to fix upon one cucumber and no more of this branch, and that as near the root as may be. Let it be a perfectly fine fruit, and tie a piece of coloured worsted to the footstalk of it without tightness, to mark that it is not to be gathered; lay under this a Dutch tile, with the rough side uppermost, and take care this fruit is never wetted in watering the plant; thus let it remain to take its time in ripening. Mark one fruit of the earliest crop, one of those on ridges, and one of the girkin crop every season, and there will be no want of seed.

When these seed-cucumbers are perfectly ripened, gather them, and lay them in the
sun

sun for three days upon a tile; then open them lengthways, and sweep out the seeds with a small soft pencil brush; spread them upon a sheet or two of whitey brown paper to absorb the moisture, and turn them often over to fresh paper, till they are dry; then clean them carefully without bruising, and put them up in paper, marking the kind, and the date of the year, on each. Lay them up in a dry cupboard, and sow them when they are three years from the gathering: thus the crops will be improved every season. The time is all the difficulty, for there is no more trouble than in the common random way of doing it.

C H A P. LXXII.

Of Melons.

THE melon is so nearly allied to the cucumber, both in its nature and proper culture, that the one being understood, there will be no great difficulty about the other.

There are a vast variety of kinds of the melon, but the choice yet lies in a small compass; those large yellow melons which are raised for the common-markets, where size is more regarded than taste, are very pitiful things, and beneath all just regard.

The old musk-melon, which is in a great measure banished by new kinds, is one of the finest in the world when well managed; but the most fashionable is the roman-melon, commonly called the CAUTALEUPE: there is also another kind very valuable, which is distinctly called the ROMANA, and comes a little earlier than the cautaleupe. These two and the old musk-melon, are the only kinds that need be cultivated; as the romana is earlier, the musk is later than the cautaleupe: therefore we shall give the method of culture appropriated to the cautaleupe-melon; and the others may be raised exactly by the same directions, only sowing the seeds of the romana a fortnight sooner, and those of the musk a fortnight later than the time of the other.

To raise the cautaleupe-melon in its greatest perfection, proceed thus. Take care to have perfectly good seed of three years old and no more; about the twenty second of February sow some of this upon a clear place, and the upper side of the cucumber-bed; sow them at a moderate distance, and cover them near half an inch with mould; by that time the seeds have been three days sown, it will be proper to prepare the dung for the bed, into which they are to be transplanted. The dung should be mixed up with ashes as for the cucumber-bed,

bed; but there must be a larger quantity of it allowed in proportion than for cucumbers.

It must be turned and made up into a new heap at the end of the week; and four days after that it must be turned and made up into a heap again, then in four days more it will be fit for use.

Chuse a very dry and warm part of the kitchen-garden, and dig out a trench for the dung two spade deep, and two yards wide; throw out the mould, and ram the bottom. Then lay in the dung carefully and even; reserving the fine small stuff for the top: when this is all on, put the frames upon it, and shut down the glasses; thus let it remain four days, to heat regularly before the mould is laid on; the mould should be the common compost already directed, mixed up with one fifth part of old and well rotted cow-dung; and this should be prepared the season before it is wanted; that there may always be a quantity of it in readiness.

On the fifth day, or the evening of the fourth, bring in a quantity of this mould, and pile up a hill of it half a yard high, in the middle of each light: cover the rest of the surface only half a hand's breadth deep, and thus leave it to warm, covering down the glasses as at first. Thus let the whole remain three days, and the mould

will then be in a condition to renew the plants: they will be all this time taking their growth in the cucumber-bed, and will be of a size fit for removing without danger, by the time the bed is thus got ready for them.

In the evening of this third day, after the covering of the bed, take up the young plants carefully with a trowel, and without hurting their tender fibres; plant two of them with great care upon each hill of mould under the lights, first cutting off just the sharp top of the hill, then give them a gentle watering, and put down the glasses; cover them with mats at night, and in the middle of the day, if the sun shines bright; and thus preserve the plants from cold and sun-shine till they have taken good root. They will naturally be of a good size for the removal, if this method be followed, that is, they will have just got their third leaf in good condition, by that time their bed is ready for them.

When it is seen which of the two in each light is the strongest and finest plant, pull up the other; for only one is to grow upon each hill, then there is to be very little water allowed; and as the plants begin to grow, more mould must be brought to the bed. This should be laid on in moderate quantities, from time to time round the hills, and at their top about the
stem

of the plant, and afterwards over the rest of the bed; and it should be laid close, and beat down with the back of a shovel about the hill: this must be continued till the whole bed is covered with sixteen inches depth of mould, and occasionally as the earth rises in thickness the frames must be raised a little; observing still to keep the mould close at their bottoms, that the plants may not come up too near the glasses.

The great care in the management of the plants, is to make them spread out into branches; and this must be done by stopping the shoots, and must be begun early.

When the plants have four or five good leaves, nip off the top with the finger and thumb; this will make the stem send out two or three more branches: when these are grown to some little length, nip off their ends in the same manner; and they will each shoot out two or three more, then after a little growth the ends of these must be nipped off also; and thus the plant will be made to branch out extremely; and these branches being properly laid, will cover the whole bed.

When the plants are advanced to this growth, great care must be taken to give them air, as often and as much as possibly can be done with safety, by raising the glasses; and they must have very little water.

If the driness of the mould, or the hanging of the leaves, shews at any time that they absolutely require it, it must be given at a distance from the root.

When the plants have grown so as to cover the whole surface of the beds within the frames, there must be a trench dug up of a yard and half wide, on each side of the hot-bed, and the mould of this must be thrown out, then some dung must be laid in and raised to the same height with that of the bed; and this must be covered with the same thickness of mould, as is laid upon the original bed itself; and this must be beat down in the same manner. Thus the bed will be vastly extended in breadth, and the plants will flourish accordingly. The frames should be raised up on some brickbats, as soon as this addition is made to the breadth of the bed; and the branches suffered to run out under them, and to spread themselves over the whole surface of the added breadth; keeping them at a distance, from and perfectly clear of one another; thus they will soon come into fruit, which they will ripen to perfection.

When the fruit is formed, there comes on the nice article of taking off a part of the runners or branches: this is properly speaking the pruning of the melon plant, and

and on the doing it right depends the success of the fruit.

When the fruit are so well set that it may be seen which are the finest, make a choice of one and no more upon each runner to stand and ripen, and give all the nourishment to it, by taking off the others, and stopping the farther growth of the runner itself. The first care is to take the male flowers when they are perfectly ripe, and whelm them down upon the female ones, touching them on the outer surface with the finger, to shake off the dust into the female. This must be done particularly carefully, on those female flowers which are nearest the part of the runner which joins the main stem; for these always produce the largest and finest fruits. When this care has provided for a good and full impregnation of those flowers, which are likely to yield the best fruit, the finest of these fruits on each runner is to be selected, that is, the largest fruit, and the thickest stalked; then the runner is to be pinched off at the third joint above the place of this fruit, and all that happen to be upon the part of the runner that is left, must be also taken off; and the runner must have a pinch at the second joint above the fruit, tho' not to break it.

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The number of melons thus left upon each plant will be small; but they will ripen perfectly, and have their full size and flavour: whereas if there had been more, they would all have been bad, for they would have starved and spoiled one another, and in this way there will be a fresh supply soon; for the pinching off every runner at the third joint above the fruit, will occasion fresh ones to come out in the places just below, and these will take their proper growth, while the first fruit are ripening, and they make a long succession. Once in ten days it will be necessary to look over the plants with care for this purpose, constantly managing them in this manner; and by these means each plant will always have as many fruit on it at a time, as it can well feed, and not exhaust itself; and by taking this care, and allowing the quantity of mould before directed, to be added to the beds for the root to run into, with now and then a little water for the refreshment of them, the melon plants will continue in strength and vigour till the frost, and will till then produce a succession of fruit, all good and perfect. As to the rest of the care, the season must give the proper direction; the frames should never be removed from off the beds; nor should the glasses be kept off entirely, except

except in the very finest weather, and when the nights are perfectly warm: at all other times they serve as an excellent defence against all accidents.

With regard to that part of the plants which runs out from under the frames, and lies upon the new made ground, if the season be mild, there requires no particular care about it; but if the nights be cold about the time when these have just made their way out, they must be covered with pieces of mat, that the severity of the air may not hurt them.

It may be proper to make a second sowing of melons about eighteen days after the first, to be managed exactly as these; and to supply the place of any that may be lost, or injured by accidents: but beside these, there is also an easy way of raising this fruit a little latter in the season without frames or lights, in the manner that the cucumbers on ridges are managed.

For this purpose some good melon-seed must be sown about the twentieth of April, upon a vacant spot of the cucumber-bed, as was directed to the earlier kinds; and then prepare the trench for the bed, which is to receive them. This must be dug out two spades depth, and the mould thrown out: it must be a yard and quarter broad, and in length adapted to the number of plants

plants designed to be raised. These are to stand at four foot and a half distance from one another; therefore the length of the bed is easily known: make up a heap of dung fresh from the stable, with ashes as before directed, and when it has lain the due time to heat, wheel it into the trench. Ten wheel-barrows of dung well filled will be sufficient for every four foot and a half of the bed, that is, for the place of every plant; this must be carefully laid into the trench, and flatted smooth; the small stuff which is left when the rest is laid in, must be put uppermost, and again levelled and struck down with the back of a spade; then some mould, the same as before described, must be brought in; and a heap of it half a yard high must be laid over the place where every plant is to stand. The rest of the bed is to be covered only four inches: when this is done, whelm down a bell-glass over each heap of mould, pressing its edges close into the earth, and thus leave it three days; in that time the heat of the dung will thoroughly warm the heap of mould, and being of the same temperature at least with that of the cucumber-bed, wherein the young plants are now growing, it will be fit to receive them without danger of accidents.

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The plants which have been all this while taking their free growth from seed, will be in a very good condition to remove by the end of the preparation of their bed: they must be carefully raised with a hollow trowel, preserving a good ball of earth with them, and sowing all their fibres unhurt.

Plant two of these on each hill of mould, give them a gentle watering; cover them with the glasses again, and at night lay a mat over each glass, as also at noon-day, if the sun shines fierce upon them.

They will quickly be well rooted in the new mould; and when it is seen which of the two is the strongest plant, the other is to be pulled up.

After this the glasses must be raised a little at times, to admit fresh air; and when the plants have four or five leaves, the tops must be pinched off, to make them shoot out branches, and then the heads of these branches must be pinched off when they have got three joints, to make them send out runners.

The plants will by this time fill the glasses, and the glasses must be raised upon brickbats, to let out their ends; thus they will have the air at a season they can bear

bear, and all the while the glasses will shade and shelter their roots.

When the plants are let loose from the glasses, the rest of the bed must be covered two spades depth, with the mould thrown out of the trench; and this must be well beat down. If the nights prove cold, some mats must be laid over the parts of the plants which have not the cover of the glasses; and if there come on a rainy season, hoops must be placed over the beds, and mats drawn over them, so as to cover up the beds entirely. At all other times when rains fall, mats must be laid over the plants, and removed when the shower is over, for there is nothing so destructive of these plants as wet.

When the plants cover the bed, a new trench must be dug close on each side of it, of three foot and a half broad, and the mould thrown out as in the former instance; then there must be a quantity of dung prepared just as the first, laid in and raised to the height of the other; and this must be in the same manner covered, with two spades depth of mould, which was thrown out of the trench, which must be beat down as the former. Thus the bed is extended each way, to give room for the plants to spread; and at the same time there will be a heat in the new dung, that will

will communicate itself to the original dung, and mould of the bed, and restore and preserve a long time the warmth which was decaying in it.

The branches and runners of the plants must be laid carefully and regularly over the bed; and fasten down the pegs, and after this the beds must in dry times have a little water, but not near their stems; and when the fruits set, the ends of the runners must be pinched off, and all the fruit of each runner taken away, except one near the stem, which will then ripen very finely. Thus new runners will be produced by stopping the old in this manner, by pinching off their ends, and there will be a succession of fruit for a long time.

It has been lately found, that oiled paper will answer the purpose of glass, for the melon beds on many occasions; but unless due care be taken, there may happen mischief from it. Linseed oil is the most proper to be used, because it dries soon; but it has the inconvenience of a very ill smell; therefore the paper must be oiled long before it is used. A covering of any bigness may be made of this, by pasting many sheets of paper together; and being light, they are easily supported. The best frame-work for them is made of common laths, set sloping each way, and meeting at
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the top, so as to resemble the roof of a house; this is cheap, light, and commodious. It will perfectly well answer the purpose; and tho' invented only for melons, may be used for many other occasions of shelter.

All that remains under this article, is to direct the sowing the seed; and this is not to be done in the usual way of fixing upon certain fruits, while on the plant, for that purpose; but by observing those that prove the finest at table.

Great care must be taken in cutting the melons at a due degree of ripeness, not only on account of the seed, but for the sake of the fruit itself; for it never has the true flavour, unless when of the exact degree of ripeness. The colour is no mark in the better sort of melons; for that does not change till they are too ripe, for their full excellence; when a melon begins to crack at the stalk and to swell, it is immediately to be cut. Then, when it is brought to table, the condition of the flesh will shew whether it has seeds worth sowing; when a melon grows very fine, the flesh firm and large in quantity, and the flavour truly delicate, scoop out the whole mass of pulp and seeds together from the heart of it, and lay them in this condition upon a plate, where they are to remain three days.

days. At the end of this time, throw them into a bason of river-water, to wash away the pulp; let them be washed very gently, and throw away all such light seeds as float upon the surface: the rest wash again in two or three other waters, then lay them upon a chalkstone to dry, and when the greater part of the moisture is absorbed from them, spread them upon some sheets of whitey brown paper, and let them lie to dry farther. The next day turn them over to some fresh sheets of the same paper, and thus manage them till they are perfectly dry and clean; then tie them up in papers, writing on the outside the date of the month and year, and the nature and quality of the fruit from which they were taken. The table will constantly supply fresh parcels of excellent seed in this manner; and the dates will shew not only the age of the seed, but the season of the fruits ripening; so that early seed may be selected for plants intended to fruit early, this being a material article in that consideration; and there will be the choice of good seed from several fruits, with their qualities expressed for every season.

The melon-seed should never be sown till it is three years old, nor ever after it is five; but this, when once the gardener is got into the way of it, will be easy:

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he will constantly sow many parcels of seed every year, which will give him every year a choice, and the dates cannot deceive him, so that he will know when to throw away that which is old and useless.

C H A P. LXXIII.

Of Tomatoes.

ANY fruit of the kitchen-garden will come with an ill grace after the melon; but this requiring a hot-bed for first raising the plant, falls best in at this place, after the management of hot-beds has been explained at large. The tomatoe is a large fruit, very juicy and watery, which grows on a plant allied to the nightshade kind, and called lycopersion: we have been used to call them love apples, but at present have adopted the Italian name; the people of that country having taught us to use them in soops.

The plant is annual, and lives only till the first frosts; the seeds are to be sown in spring upon a hot-bed, and the young plants removed from that to a second, and then into the open ground; a small hot-bed should be made in the beginning of March, for this and some other such kinds;

kinds. It is to be constructed just as those before described; and being covered five inches thick with mould, the seeds of the tomatoe must be sprinkled on, and a quarter of an inch of the same mould sifted over them; thus they will soon shoot: when the young plants rise close, one or two must be pulled up, and after this the rest must be carefully and gently watered. The glasses must be constantly kept shut at first, except for raising them a very little at one edge, in the heat of the day; when the plants are a finger's length high, another such hot-bed must be made for them; and they must be removed carefully into it in a mild afternoon, planting them by line, at four inches distance, and giving them a gentle watering.

The glasses must be kept shut till they are rooted in this new bed, and even covered with mats, if the weather be very bright: when they are once well established, they must be by degrees inur'd to the air; and at length, when they are too big to be kept any longer in the frame, they must be carefully taken up and planted in a warm border, in the open ground, at a yard distance; they must be taken out of the bed with a large ball of their own earth about them; and the best season is a mild moist evening towards the end of May.

They must be watered carefully till they have taken root, and afterwards the ground must be often hoed between them: the fruit will ripen in July, and there will be a succession of it till after Michaelmas. Some of the earliest and finest fruit must be taken off for seed; and the seeds taken out with care, and dried and preserved as those of the other kinds. Every year there should be a fresh quantity of the plants raised, and the seed saved, for this should always be sown the very next spring after it is taken from the fruit. These are the several products expected from a kitchen-garden, and these are the best methods of raising them according to the seasons; and if any person should chuse to introduce new kinds, or propagate some which we do not at present, tho' other nations use them, there will, after a due knowledge of these rules, be no difficulty; for according to their nature they may be raised in the same manner as those nearest of kin to them, among the preceding kinds. Thus, if any one chuses the goats-beard of our meadows, it may be cultivated exactly as the falfafie, of which it is a wild kind; and if any one chuse to raise dandelions, instead of sending for it into the fields, it may be managed just as endive. The Spaniards eat the fruit of the purple egg plant, as

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do the love-apples or tomatoes; and this plant, if any should like to try it here, will be raised very successfully by the very same method as the tomatoe. This we observe, that the gentleman, who is curious in his kitchen-garden products, may know the rules here laid down contain the whole practice; and are applicable not only to all the kinds of products which we have in use, but to all others that we can desire to add to the number. Indeed not only the customs of other countries point out to us some additions under this article; but our own fields and woods offer many things worth regard. The earth-nut or bulbæ-castanum is the sweetest of all roots; and tho' no bigger than a chesnut, in our sandy grounds may probably be raised to excellence by a proper culture. I am not ignorant it has been tried, but not upon these principles. It certainly is in the same state of nature with many of those things we have brought to perfection; and probably whoever will try it in the methods here laid down, allowing it sufficient room, good digging, and change of soil, will add a delicacy to the modern table.

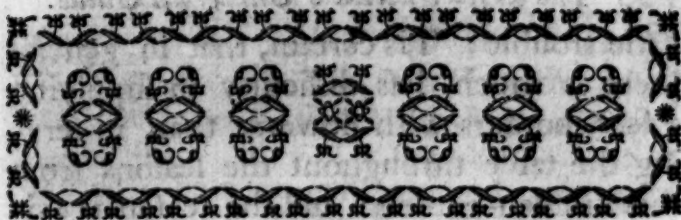
As much might be said of some other few natural wild plants; but this is not the place. We are confined to cer-

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tain bounds in this publication; and our business is to lay down what plants are cultivated, not what may be. This slight hint may however be excused; perhaps it may also be useful.



B O O K



B O O K. II.



OF THE PLEASURE-GARDEN.

A VERY common gardener thinks himself a master of the work that is necessary to be done in the borders of a piece of pleasure-ground, and of the preparations for raising the plants, which are to fill them. But if the gentleman who has a relish for the culture and disposition of plants, will bestow an eye upon this part himself, he will find it capable of prodigious improvement, nay, he will soon see that what are supposed to be more difficult articles under this head, may be practised in a regular manner with certainty of success, and with very little

little trouble: 'Tis certain, that in general there is much less difficulty in supplying a few borders with flowers, than in serving the table throughout the seasons from the kitchen-garden: and the reason is evident, because these very plant requires a distinct and particular culture; and here a few general methods may be said to comprehend all. But because there is less difficulty in this, there should not be the less attention bestowed upon it; since less pains serve the purpose, let it have fully the little that is necessary: 'tis certain that all the plants we raise for beauty may be comprehended under the few classes of hardy and tender, annual and perennial, and that one general method of treatment answers to all the vast numbers comprehended under each class. For this reason no care or attention can be too much, for the compleatly understanding these few methods: We propose to treat of the pleasure-garden in this manner, at once avoiding the too slight method of common workmen, and the needless obscurity and prolixity of common writers. The culture of the kitchen-garden, so fully laid down already, will amply explain the management of ground, and the raising of vegetables in general; so that we may be much the shorter in this part upon the usual operations. We shall endeavour

deavour to be plain, and lay down the whole practically, according to the latest writer on these subjects, and to our own experience.

C H A P. I.

Of the Pleasure-Garden.

A Pleasure-garden should be considered under four articles. The owner is to have, 1. Hardy plants; and, 2. Flowering-shrubs; both which stand all the year in the borders: 3. Tender-annuals; which are to be raised in hot-beds, and brought into the common borders during summer; and, 4. Choice flowers which are produced in feed-beds with great care, and afterwards planted in particular beds.

Of the first sort, or hardy plants, that stand the winter, are campanulas, French honeysuckles, hollyhocks, columbines, sweet-williams, wall-flowers, and the like. These are to be raised from seed in a nursery, and brought into the garden the season before they are to flower.

Of the second kind, or shrubs, are roses, honeysuckles, lilac's, or the like, which are to be raised from layers or cuttings, or from suckers, in the same nursery with the hardy plants.

Of the third kind, or tender-annuals, are French and African marygolds, balsams, globe amaranths, and china-afters. These
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are to be removed from one hot-bed to another; till the season growing warm, and they gathering strength, they are at length planted in the borders; and thrive as if they had been raised there from the first.

Of the fourth kind, or choice flowers, are auriculas's, carnations, tulips, anemones, ranunculus's, and the like. These are all perennial; and to have them in perfection, they must be raised from seed in a nursery, and in due time brought into the garden.

Under these four heads may be comprehended the whole practice of common gardening; and as each class of these has a particular course of culture, the business may accordingly be divided into four kinds:

1. The raising tender annuals on hot-beds in spring.
 2. The raising hardy biennials or perennials in the nursery in the open ground.
 3. The management of choice and curious flowers: which differs no way from the former, but in that it requires more time and care: and,
 4. The propagating trees and shrubs, by cuttings, layers, or suckers.
- He that knows how to do these four things, is qualified to take care of any common garden; and when he rightly understands the culture of one plant

plant of either class, he will know how to manage them all.

Any plant in the world is reducible to one or other of these four kinds; and therefore all gardening may be comprised within this moderate compass. Those who have extended it to large volumes, have delivered separately the culture of every species: but this is only repeating, many times over, the very same directions.

C H A P. II.

Of the Disposition of a Garden.

BEFORE the care of raising plants, there naturally comes the provision of a soil for them to grow in. The garden must have good mould, and the proper conveniences, else no art can give it beauty.

If the borders be poor, bring in some old well rotted dung, mixed with some rich and fresh pasture mould, and a good quantity of that rotten earth which is found under old stacks of faggots. These should be well worked together, and then dug into the ground, in such quantity as may appear necessary: more when it is poorer, and less when it is something better.

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Let the ground be open to the south, south-east and south-west, but well sheltered against the north and north-east. If former ill management has suffered trees or walls to those quarters where it shall be open, let them be lopped, taken down or removed; and if there wants shelter on the other sides, let it be given by a plantation of forest-trees, or by walls.

The pleasure-garden is designed not only to delight the eye with its own products, but with the distant view of woods, waters, enclosed ground, and a pleasant country. For this purpose it must be a little elevated, that it may command the view, and open to it in the proper places: but all must here be moderated with a timely care: a piece of ground that lies too high will never make a good garden, nor must the spot be exposed to the cold quarters of the heavens, because neither can the plants thrive in such exposure, nor the owner enjoy them or the prospects. Therefore the elevation must be slight, and the ground should slope down to the south-west, and the views of the country should be thro' vista's well disposed, or from the terminations of walks well sheltered. The natural soil must be good, for it would be a work of vast expence to mend a bad one throughout the whole extent of such a
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piece of ground; and there must be a sufficient supply of water, or easy means of obtaining it.

What we have directed already as to the nature of soil, and water, in treating of the kitchen-garden, holds equally of this, and need not be repeated. Indeed if there be not upon the spot fixed on for a pleasure-garden the full depth of mould, we have directed where the kitchen-ground is to be, it may do; but there should not be much less. If there be a natural spring upon the spot, it is a great happiness; but if not, the same methods may be used as have been directed for the kitchen-garden.

When such a piece of ground is chosen, the first care must be to contrive for water in various parts of it according to the extent, to save the carriage from one place to another. Then the natural beauties of the place must be examined, and care taken to preserve and improve them; and next the blemishes and imperfections must be observed, that they may be hid without the expence of columns or of statues: a well disposed bush, or little chump of trees, according to the distance, may terminate a short view within the bounds of the garden. Trees must be planted to defend the ground from the cold

cold quarters, and for hiding the disagreeable objects.

Thus much considered, we may come to the disposition, in which there is more room for taste than in almost any article of life whatsoever. Where there are beautiful objects out of the compass of the ground, these must not only be kept in view, but, where it can be done, they must seem a part of the garden. This is easy when considered in time; for a hedge in the garden may be continued in a line with a hedge out of the garden; and if the fence in such place be a *haha*, the surface of the ground will also be continued to the eye; and this method, with judgment, will in effect enlarge the compass vastly, without any addition of expence.

The method of laying out is as various as the nature of the ground; but in general large lawns of grass, with well-chosen plantations to flank them, are the great article; and along their sides are to run borders, and in various places are to be made chumps for flowering-shrubs, and the more specious plants.

These borders we would advise to be half as broad again as is generally allowed, for they will be by that means capable of receiving and supporting a greater number of plants; and the addition these give to
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the elegance of the place, is much more than is commonly conceived. Every one knows the smiling beauty of a common ditch-bank, in the full spring, covered with its variety of weeds; 'tis this variety that gives the beauty; and what can please the eye in wild nature, may be laid before it infinitely more agreeable from the effect of art. We have more variety and infinitely more beauty; the plants of North-America bear their own climate perfectly, and many of them flower late in summer, and throughout autumn: with these and others we can keep up that bloom of spring, which please in the hedge-rows for a fortnight, all the year, and add new beauty by the right choice of the plants. Thus far also we should favour Nature's aspect, that these borders should be raised a few inches to the back, sloping forwards.

These will contain a very great variety of plants and flowers; but beside the place those beauties find in these and in the chumps, there should be a part of the ground selected for a FLOWER-GARDEN, distinct from the pleasure-garden. These two things have been confounded, but they are absolutely distinct in their nature; for the finest kinds of flowers should be always raised on a particular kind of beds; and require certain articles of shelter and defence

defence, and the other management, which must not come in sight of a view of pleasure. Beside, their beauties are too delicate for the sort of view we have of them in a pleasure-garden: they require the eye to be brought near to distinguish those peculiar marks of excellence, for which they are cultivated with so much care; and they should therefore be kept apart, and those selected for the common service of the borders in the pleasure-garden, which are large, and of a more distinct appearance. This will explain what we mean hereafter, when we speak of the flower-garden and pleasure-garden distinctly; as we frequently shall have occasion to do, directing the finest and most delicate sorts of seedling flowers to be planted in the flower-garden, and those of more specious appearance, but less real excellence, in the pleasure-garden.

Tho' grass pleases, and indeed refreshes the eye beyond all other objects, it is not fit for walking on, unless at the driest seasons; but 'tis easy to procure that great convenience at all times, when the air will permit a prudent person to be abroad, by means of gravel. Therefore, in the very original laying out of the ground, there must be a careful contrivance for this.

How to lay out a garden. Gravel-

Gravel-walks must be so laid down as to be as long as they can, and from one or other of them to give a view of every part of the garden, and of all that is agreeable that is to be seen from it: and there is one consideration more, which is, that as we have chosen the ground with a small descent, there must be some of these walks laid in the terrace manner that is quite level, that the uneasiness of walking up and down hill may be avoided, by those who are infirm or have tender feet. One of these walks should always be carried along under a south wall, that in the coldest weather which can possibly bear walking, there may be a place for it; and this must be open to the garden to the south, and bordered under the wall with proper flowering-plants; one or other of which in so excellent a situation will continue in bloom thro' the whole winter.

On the south verge of such a walk I have seen wall-flowers, cyclamers, polyanthus, and anemones, primroses, hellebon, stock July flowers, narcissus's, golden-rod, snow-drops, winter hyacinths, navelwort, periwinkles, yellow-alyssum, and winter aconite, beside the laurustive arbutus, clematis, and some other hardy shrubs, all in their full bloom, at a time when the rest of the garden was covered with snow; and the walk by proper management

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dry, and the air warm by the reflection of the noon-day sun from the wall, at a time when the depth and dreary part of winter reigned every where else. This is in every one's power; for there is no garden that has not a south-side, nor are any of these plants scarce or difficult of culture: the use of a garden is to entertain the eye, and give agreeable opportunities of exercise; and thus we have both purposes answered, even at those seasons when it would be vain to seek them any where else.

A great deal in this case depends upon the laying the gravel-walk. If it lie flat, it will be wet in spite of all the possible care that can be taken of it; and our common gardeners have fallen into the other extreme, of laying these walks too round to avoid it. There is a medium in all things; but 'tis hard to hit it; when a walk is laid too high in the middle, there is no part of it where a person can tread without uneasiness, except the very ridge or center, which I have often seen, from that very cause, trampled into a flat, and therefore decay when all the rest of the walk has been perfectly dry: the foot is flat, and it requires a flat surface to tread upon. A little deviation from this will not be felt; but when it is any thing considerable, as in these over-rounded walks, a person is obliged

obliged to tread uneasy, and walk side ways; and the feet are continually strained and hurt by it. Exercise is the life of old men; and 'tis in this kind of walks they can best take it. The gout and gravel, the natural tribute the human fabrick pays to long life, would be relieved extremely by such exercise on a proper walk; but one of these over-rounded ones will give that disorder in the feet it should prevent.

There is a certain standard of right in all these things; but not only common gardeners, but the generality of their directors, have exceeded it. Mr. *Miller*, who has written beyond dispute the best book ever published on the subject, allows six inches rise in the middle of a gravel walk of thirty foot broad; but experience and fair trial have shewn me this allowance is too great, and that four inches and a half is full sufficient. The intent is only to prevent the wet from lodging, and this degree of roundness will be enough for that service, provided the walk is kept well rolled, and without that nothing will keep it dry: this is a rise which will answer all the purpose, and which the eye will not perceive, nor the foot feel; the walk will appear both in walking and in looking on it to be flat.

A walk of this kind should always open one way or other from the house itself, for

it is in vain to have a dry walk, if there must be a wet way to it. The gravel surface of the garden should also be somewhat below the parlour-floor of the house, as it naturally will in such a piece of ground as we have directed to be chosen: and the descent into it should be by two or three steps: there is something poor in the method of walking strait out of a parlour into the level of a garden-walk; and when things have been thus managed at first, in a course of years generally the floor of the parlour becomes lower than the walk, and the whole floor is damp. It is strange, and contrary to reason, to walk up steps into a garden; and on the other hand the method here directed is not only proper and wholesome, but most agreeable; for from this little ascent we see the garden agreeably from the house, even when we are not walking in it.

In the plantations which edge the leaves and grass walks, there must be always a small degree of well-considered irregularity; a strait line is by no means proper for the sides, for this is the plain effect of art; and the great consideration in a garden is to give it an air of elegant nature, therefore a serpentine is better than a strait edge; but in this the wave should be slight,
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not too conspicuous; and here and there a tree should be brought two foot forward from the rest: this will give a great air of nature; nor is there any object more beautiful than a tree rising out of a fine bed of grass.

These trees in general should be planted at a considerable distance one from another, for they will thrive better; and this way also will have more an air of nature.

The elm in general is the fittest of all trees for these plantations, for the prodigious quantity of its leaves gives great elegance, and their natural rough surface gives a soft and velvety appearance, which the ash and oak evidently want. In all parts of the garden, except when the winter-walk just described is laid out, the flowers should be concealed, by planting shrubs before them; and the more ever-greens there are in these walks the better, because they will answer the same purposes in winter. In general nothing is so sad a sight in a garden as a brick-wall. Nothing else shews the absolute termination of the ground; and of all things we should conceal the boundaries of a garden.

As this peculiar walk is contrived for winter, there should be more than one for the full sun and heat of summer. A cool walk, under the shelter of some naturally

spreading elms, where we can enjoy shade and shelter, when the whole air beside is burnt, and glows with an insufferable brightness, is a vast advantage. The same purpose is answered by wildernesses; but a single walk open on all but one side may be often dry, when the walks in those plantations are damp; therefore there should be both. The wilderness rises high, and makes the air damp, where it is placed; therefore it must not be in a place where the view is beautiful into the country, nor must it be near the house. The spot to be chosen for this plantation is in some part of the ground remote from the house, and where there are objects to conceal, at least none worth the seeing: the plantation must not be made too thick, the walks must be lightly serpentine; and flowering shrubs, and hardy plants that bear shade, should be planted on each side of the walks before the trees. This gives at once extent and beauty. As shade is the great purpose of these wildernesses, there must be a shady way to them; and the best is by a broad gravel-walk, with a double row of large trees on each side of it.

When these and the other plantations are measured out for distance, the eye is not to consider them, as they will appear when first planted, but to look forward to
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the time when the thin naked poles will have enlarged their trunks, and shot out spreading branches. That plantation of trees which does not look too distant at first, will be a great deal too close in a very few years.

Finally, as to the extent of the several parts, lawns, walks, and wildernesses, this must always be proportioned to the general extent of the ground itself: where that is large, all the parts should be also large, for that gives dignity; and where it is smaller, the parts must be fewer in number, that there may be got so much extent for each, as will keep it from being ridiculous.

This kind of disposition will give beauty and convenience; the flowers which are raised for the chumps and borders, will live and thrive well in them, because there will be free air; and the part of the ground separated from the rest for the flower-garden, will have natural shelter and defence: the soil we have directed will feed and defend the choicest plants which bear the open air in our climate. The next requisite is water. Ponds must be sunk in proper places; and these should be shallow, and clayed at the bottom. If nature has given such, it is very fortunate; if not, they must be made. Any water will do that has stood some time in such places; even pump-water itself: for it

softens with the air and sun. In a ground of some extent, there should be two or three of these; because the labour of carrying water to a distance is very great; and when gardeners neglect it, the plants never thrive.

All that is required farther, is a nursery, and a place for hot-beds. A piece of ground about an eighth part as big as the garden will serve for a nursery; and one half as big as that will be sufficient for the other purpose.

C H A P. III.

Of the Nursery.

THE nursery should lie to the south-east, and be well-sheltered from the cold quarters. It should be hid from the garden, because there is no beauty in it; and there should be a little of the same enriching ingredients allowed to the mould in this place, that are used for the borders in the garden. It must not be so much; because the plants will thrive better for being removed into a somewhat richer soil: but yet there should be some. It is a custom to let the nursery have a very poor ground; but that is wrong, as extremes commonly are. Many nurseries now have the soil
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very rich; and upon enquiry I find no plants succeed better than those which have been brought out of such ground. If the seeds be sown in a poor soil, the first shoot will be weak; and when they come to be removed out of the seed-bed into a nursery-bed, they are hardly able to get over the check of it: whereas if they are first raised in tolerably good ground, the original shoot is strong, and the power of vegetation soon gets over the check of that and the other removals. This is agreeable to reason, and found true in practice. In short, such as the first shoot is, such the tree or plant will be; and the old practice of keeping a nursery poor is wrong. But moderation must be the rule; and though the mould of this spot should be good, it must not be equally rich with that of the garden.

The aspect determines where the nursery must be placed; but the spot for the hot-beds must be chosen according to convenience. It should be a warm corner of the ground, near the borders, though hid from sight; and it must be also near the stable, or the place from whence the dung is to be brought. The closer it is to the borders, the easier it will be to remove the plants with good balls of earth to their roots; and they will always take the sooner,

sooner, the better the old earth is preserved about them.

There is no piece of ground so small, but this division may be put in practice: and setting out right, all will be easy.

The ground being prepared, we may proceed to the four methods of culture by which the plants are to be raised.

C H A P. IV.

Of raising Tender Annuals on Hot-Beds.

THE flowers we raise for the latter end of summer and autumn, are mostly natives of warmer climates, and their roots perish in winter. They are to be produced every year from seed; and as our early weather is too cold for them, we are obliged to raise them with the assistance of heat and shelter early in the spring, that they may be forward in the beginning of summer, so as to flower in autumn: and after having decorated our garden for the two latest months, may ripen their seeds before the frost nips their roots. This is the reason of the hot-bed culture, which is to be performed in the following manner.

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The hot-bed is a bed of mould warmed by the vapour of dung, and covered from the air by a frame. It differs scarce at all from that we have directed for the kitchen-garden; except in depth of the ingredients and duration.

The mould should be the same with that of the borders of the garden; but it must be skreened very fine. And the first care is this: In the month of January a sufficient quantity of this fine mould must be brought into the hot-bed quarter, and laid in a heap. There will be required for these plants a succession of three hot-beds; and there should be as much mould first laid in, as will be sufficient for them all.

The frames are next to be prepared. The number and bigness of these must be proportioned to the quantity of plants intended to be raised; but care must be taken they are well put together, and that the glasses shut close upon them. This will bring on the time to the middle of February, and the dung should then be got ready, and the ground opened for the beds. Get in a good quantity of coal-ashes sifted, but not very fine, and save the cinders in another heap: then bring in three or four loads of dung more or less, according to the ground. Let it come with the litter among it; and the
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the wetter it is with the urine, the better. Any dung of horses will do, but that of high-fed coach-horses is best. It should be brought directly from the stable into the ground. As this is wheeled in, some of the sifted ashes must be sprinkled over it. About five pecks to a load of dung should be thus added, and mixed in well among it.

When all the dung is made up into a heap with this mixture, let it lie eight days to heat.

Then mark out the place where the beds are to be made. Dig out the mould one spade deep in a long square, of the shape of the intended bed, and lay that away. Throw some of the cinders into the trench, and spread them even with a rake to cover the bottom about two inches: then lay in the dung upon this bed of cinders: take it up with a fork, and shake every forkful as it is taken from the heap. By this means the longest stuff will come first; and the shortest, which is the richest, will be left for the last, to make the top of the bed. Spread the litter even, as it is thrown into the trench, and beat it down well at times with the back of a spade, to make the long stuff lie close and compact together. Raise the bed of dung in this manner about a yard high, and spread the
small

small stuff which comes last, and is almost all dung, evenly upon the surface.

Then bring on the mould from the heap laid up for that purpose, and cover the dung five inches deep.

C H A P. V.

Of the Culture of Hot-Bed Plants.

THE bed being thus finished, the the frame must be put on, and covered with the glasses. Thus let it lie four-and-twenty hours to settle, and warm the mould: then lay the surface perfectly level, and scatter on the seeds moderately thick: the Balsam, Amaranth, China-after, and French marygold, with the several other kinds, may be all sown together; for the same management will raise them: but it is best to divide the bed into as many squares as there are kinds, by drawing slight lines over it, and in each square to sow one kind of seed.

When the seeds are all in the ground, some of the same mould must be sifted carefully over them, till they are covered a third part of an inch. Some seeds require a little more depth than others; but this thickness in a hot-bed will answer generally for all. The glasses must be raised

raised considerably in the day-time to let out the steam, and to let in fresh air, which is essential to the seeds growing well: in the night they must be shut down; but not quite close, unless the weather be very severe indeed: and even in that case they must be opened again in the morning. The warmth and moisture of the mould will soon bring up the plants, and then a new caution is required to preserve them.

Where they have risen very close, some must be pulled up. By this time the extreme heat and steam of the bed will be abated: The glasses may be kept close down all night; and there will require only a moderate raising of them for air in the warmest part of the day. Hot-bed plants require a different management at their various periods. In this state they must be kept pretty close, for they are in no danger of being drawn up weak as yet; and the seed-leaves require but little air.

When the plants have a few days growth, they will be fit for removing; and there must be another hot-bed provided for them: this should be considerably larger than the first, because the plants must stand farther asunder. Let the bed be made up in the very same manner, and let it be covered, five inches and a half deep, with the same fine mould as the first.

first. Cover it with the frame, and shut down the glass, and let it stand three days, that this thickness of mould may be thoroughly warmed.

Then in the beginning of the afternoon remove the plants. Open small holes a finger's length deep in the mould, at three inches and a half distance every way from one another. Take up the young plants out of the first hot-bed with the point of a trowel, and immediately set them in this, one plant in each hole. Take care not to break the tender roots in taking them up; nor to double or crush them in setting them in: bring the mould carefully about them; and when they are all planted, give the whole bed a very light and careful watering, taking particular care not to beat down the plants: then close the glasses, and leave them for the night.

About nine o'clock the next morning raise the glasses a little way; at noon cover them with matts, that the sun may not scorch upon the leaves, and raise them a little higher; toward evening wipe the wet off the sides of the glasses, that it may not fall back upon the plants, for it is always injurious to them.

In this bed they must stand about three weeks; and this must be their constant management:

management: the glasse must be let down at night, and kept up always in the middle of the day. They must constantly be wiped before they are shut down for the evening; and the degree of opening during the day, must be more or less according to the weather. The plants must have as much of the free air as they can bear without hurt, and the tender kinds will soon shew if there be too much allowed them. If the mould grow dry, they must be watered gently and carefully.

The heat of this bed will decline gently at the end of about three weeks; and there should, at that time, be some fresh dung laid to the sides of it: for the plants are to be removed from this hot-bed to another, and the mould of this must therefore be kept in some degree of warmth.

The plants having been sown in the end of February, will be by this time of some strength; the season will also be growing toward summer: another bed must be prepared for them about a week after the dung is laid about the old one; and this will keep them till they can bear the air. This last hot-bed must be made in the same manner as the first, but with less dung and more mould. It must be considerably larger than the former, because the plants will require a much greater distance;

tance; and there must be a depth of mould for the roots. The dung of this bed should be about two foot in heighth, and the mould seven inches and a half deep.

When it has stood covered one day and night, open holes in it at seven inches distance, and lay up the mould by the side. Take up the plants out of the former bed with large balls of earth about the roots; and set them in this with a great deal of care. Draw the mould about them, and give them a gentle watering. Cover the glassess with mats, and raise them a little in the middle of the day, but keep them close at all other times till the plants have taken perfect root. Then let them be every day opened more and more at noon, and left open longer. If the plants be kept too close, they will run up weak, and be ill-shaped. In this bed they must stand till the latter end of May, and all that time they must be watered frequently. The glassess must always be shut down at night; and when the cold is severe, they must be covered with mats. The more air is let into them in the warm hours of the day, the better.

C H A P. VI.

Of removing the Plants out of the Hot-Beds.

TOWARD the end of May the hardier kinds may be removed out of this hot-bed at once into the borders of the garden; chusing the evening of a mild day. Large holes must be opened for them, and they must be planted with great care. They must be taken up with a good ball of mould, and when they are planted again they must have careful waterings, from time to time, till they are thoroughly well rooted in the ground.

The removal of these out of the hot-bed will give more room to the tenderer kinds, which require to remain longer in it: these must be thinn'd where they are closest, taking up every third or fourth plant; and setting these immediately again in the parts of the bed left vacant by taking away the others. The new planted ones must be watered frequently, and all the rest at least once in the day. The glasses must be opened more and more every day, but the tops shaded with mats when the sun shines upon them. After this hot-bed has been made and planted a fortnight, let some mowings of short grass, or any like matter,
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be piled up round the sides of the dung: this will bring on a new warmth and fermentation, when that of the dung begins to decline: and it will be enough for keeping up the growth of the plants, yet so moderate, that they will bear removing afterwards out of the bed without danger.

When they have stood three weeks or somewhat longer in this bed, another parcel of them may be planted out into the borders. Choose the hardiest of those which are now left; so that only the most tender and delicate kinds will remain in the bed. These must be taken up with more care than ever; because being larger, they will be apt to receive a greater check in the removal: a large hole must be opened for each, and the plant must be taken up with a great ball of mould, and planted without injuring the roots. They must be watered frequently after this, till they are thoroughly settled in the new ground: for if they get a check in their growth at that time, they never make good plants afterwards. Frequent watering is the great article; but the season may be a great advantage. The principal danger may be from the sun; therefore they must always be planted in an evening, that they may have the night for striking; and if a cloudy

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time

time can be chosen, it is much the better. The difference in this respect is so great, that they should be planted two or three days sooner or later, according to this accident.

There will now remain in the bed only the tenderest kinds, and it will be time to get these into pots. A sufficient number of small pots must be provided, and they are to be filled with mould from the first heap; the leavings of which having been now so long exposed to the air, will be much richer than the rest, and very fit to receive them.

Take up the plants carefully one by one, and set them immediately one in each of the pots. This may be done in the bed by lifting up the glasses. As each is planted, let the pot be set up to the very rim in the mould of the bed. The best method is to begin by taking up the plants which stand next one end, and then opening holes along that end to let in the pots as they are done; placing them close to the wood of the frame, and as close to one another as they can stand; and filling up the space between them with mould. This is to be continued till all the plants are potted; and if the pots be of a moderate size, they will in this manner fill the bed: there will be yet warmth enough in
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the dung to keep all in a due condition for some time; and as this dies off gradually, the plants will be the more fit for the open air, into which they are soon to be removed.

They must all be watered as soon as they are potted. This is to be often repeated afterwards; and they must be inured to the air. The glasses must be set open a great part of the day; but when the sun is violent, they must be shaded with mats. In this bed they must be kept till the middle of July, defending them by the glasses from the cold of the nights; and giving them more and more air every day, till at length the glasses are to be taken entirely off in the middle of the day, when the weather is cloudy; and at last kept off entirely.

When the plants have born this some days, they will be in a condition to remove into the air; but this must yet be done with caution. A warm and well-sheltered spot in the nursery should be chosen for them, and the earth dug away a spade depth. The pots must be brought out in a warm cloudy day; and it will be best of all if there be some rain. They must be set up to the rim in this bed, and the mould laid in close among them. They must be watered every day; and they should stand thus a

week. Then the pots may be exposed to the air by setting them upon the surface of the ground; and after this they may be set out in the places where they are to flower.

They must be watered every day, and they will now want no more care.

This is the method by which all annuals may be raised to their greatest perfection. Less care is usually taken, and therefore they succeed the worse: But this is not much. A little trouble will serve a great many plants, and they will answer it very well in their beauty.

Two things farther are necessary; 1. The care of their flowering; and, 2. A provision for seeds. Both are too much neglected in common practice. Let the best plants be marked for seed; and let these be managed purposely for it. They must only be suffered to open ten or a dozen flowers: and when these are well set for seed, all the rest that offer must be taken off in the bud. These plants must be watered very often, but never a great deal at a time: and when the seed is formed, and has got its due size, they must be set against a south wall where they can stand quiet; and they must then have no more waterings. When the seed is thoroughly dry and hard, it must be gathered and kept for the next spring. If
this

this care be taken each year, the stock will increase every season in beauty.

Those plants, which are intended only for bloom, must be treated in a contrary manner. They must be watered largely once a day, and no more: and all the flowers, as they begin to fade, must be taken off with a pair of sharp scissars. This keeps the root in vigour; for nothing exhausts it like letting them set for seed: and the taking off these before that time, will produce more and more fresh bloom. When the season grows cooler, they must be removed into a place of shelter, to keep them in blow as long as that can be. When the frost seizes the mould, they will decay: but they will thus be preserved longer than could be thought in beauty, and will produce four times the quantity of flowers that they would have done if managed in the common manner.

There is nothing in this that a gentleman, ever so much unused to gardening, may not direct a common labourer to perform: and these are the flowers which make the shew of autumn.

In this manner are raised the *French and African Marygolds*, *Balsams*, and *Globe Amaranths*, *Marvel of Peru*, *Fine Amaranths*, *China Asters*, and all of the tender annual class. One set of beds will raise them all, and one kind of culture bring them to

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perfection.

perfection. This furnishes the garden with one great set of flowering plants; and the method is still easier with the greater number, these being hardy enough to bear the air of our climate, and to rise from seed without hot-beds.

C H A P. VII.

The Manner of raising Biennial and Perennial hardy Plants.

PERENNIALS are such plants as keep alive in the root during winter, and when once planted, are supposed to need little more care: but they may be made to flower much more elegantly with a little attention. The BIENNIALS perish when they have flowered, tho' they are two seasons in coming to that state. The same culture serves for both.

Of the hardy perennial kind we have named campanulas, hollyhocks, and several others. The moth-mullien is a biennial.

The seeds of these will all shoot in the common ground; and they are all to be sown in the same manner. Therefore this second culture may all be delivered in as moderate a compass as the first.

Chuse out a piece of the nursery that lies a little slanting from the north-west to the south-east, and is very well defended from cold winds. Let it be of the common mould

mould of the place; that is, of the same nature with that of the garden, but not quite so rich. Turn it up in ridges all winter, and in the beginning of March lay it all level; let it be well dug and raked, and then tread up a path along the middle, and divide the ground on each side into beds four foot and a half wide. The extent of this spot must be proportioned to the garden: but in this one place, and with one and the same care and management, may be sown and raised all the common hardy perennial and biennial plants.

In the middle of March let the seeds of the several kinds before named, and of any others that may be desired, be sown in this manner. Chuse one or more beds for each, according to the quantity intended to be raised, and rake off about half an inch of the surface; then in the evening of a calm day sow them thus: Mix with the seeds three times as much fine sifted and dry mould; it will make them spread the more evenly. Sow them by hand with this mould pretty thick, and when the surface is regularly covered with them, sift over them the mould that was first raked off from the bed. This will cover them a third of an inch, which will be perfectly sufficient. When the seeds are covered, lay three pieces of black-thorn bush upon the bed to prevent accidents; and if in two days there does not fall any

any natural shower, water the ground. This must be done very gently, and the pot should have a fine pierced nose without flaws: for if the water run out in any part in a stream, it will wash the seeds out of the ground wherever it falls. The bushes need not be removed for this watering.

All the seeds of the biennial and perennial kind being sown and sheltered in this manner, the waterings must be repeated if the season is dry; and when the plants appear, the bushes should be lifted off the ground. They will not be wanted any more; they have kept off accidental injuries, and mellowed the mould, and this was all that was required.

When the plants have a little strength, they must be thinned, by pulling up such as are weakest, where they stand too close; and they must have water whenever they want showers. This must be managed with great care; for if the plants are injured now, they do not well recover it; and a heavy watering may bruise them, or wash them out of the ground. They shoot up only leaves at present, for the stalk does not appear till the next year: but the rudiment of it is formed already; and if it be injured, the plant will never be fine afterwards. As the plants grow larger, they must be thinned again, taking up al-

ways

ways the worst. The seed was ordered to be sown pretty thick for this purpose, that there might be choice of the best to leave for growth.

If there be very sharp winds when the plants first come up, and the ground is not well defended by its natural situation, a reed-hedge should be set up to defend those which are in most danger: and if hard frosts happen, which break the ground about the new-rising plants, a little mould must be sifted over to cover them again; removing it with a finger when it would bury the heart of the plant.

Thus the danger of the early spring will be got over, and all the rest will come very easy. The plants must be weeded carefully, and the showers of April will water them.

In the beginning of May they must be transplanted; and for this purpose a bed must be dug up and levelled, much larger than the first. The evening of a mild day should be chosen for this purpose; and if the weather be showery, so much the better: the gardener may very well wait for this opportunity, since a few days sooner or later will make no great difference.

Holes must be opened for them at different distances, three, four, six, or eight inches, according to the bigness of the plants.

plants. The roots must be taken up carefully, and immediately planted, and the mould must be drawn closely about them, and settled by a good watering.

During the summer the ground must be weeded as often as any growth of that kind is seen upon it. And some of these weedings may be done by hand, but one or two should be with a trowel; breaking up all the ground between the plants at the same time that the weeds are destroyed.

If any of the plants send up stalks this first summer, they must be cut down close to the ground, for it is not their flowering season, and they will be weak and poor. The roots are to strengthen themselves in the ground this season, and nothing more is required of them.

In the beginning of October, let more ground be dug up for them, and let them be there planted at a greater distance. About twice the number of beds the plants already occupy, will be needful for this service; the ground must be dug up a full spade deep, and holes opened for the reception of the plants at double the distance of those in the former bed. An evening of a mild day should be chosen for the business, and the plants carefully taken up, each with a ball of earth. The
extreme

extreme fibres must be trimmed when they are brought to the new ground, and they must be directly set in, and the mould closed about them.

Give them a slight watering that evening, and a large one the following morning: take off the large outside decaying leaves, and the rest will thrive the better. When the weather comes on severe, lay more thorn-bushes lightly upon the beds, taking care not to crush down or wound the plants; and in the depth of winter, when there are hard frosts without any snow, spread some pea-straw over the thorn-bushes, taking it off again when the weather is any thing milder.

C H A P. VIII.

Of the farther Culture of Perennials.

EARLY the succeeding spring make a draught of the several kinds of these out of the nursery-beds for the immediate service of the garden; for the greatest part of them will flower this summer. In all quantities of flowers raised from seed, there will be some better and some worse, and no art can discover which will be good or bad; till the time of flowering is come: therefore for this first year the garden must stand

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stand its chance for good or bad; but in the following seasons it will be supplied with certainty.

The middle of February is the best time for making this plantation; for if it be delayed longer, they will flower very poorly. With tolerable care there will be no fear of loosing the roots when they are put in thus early. Let a mild day be chosen; and if the season be very severe, let it be delayed till the extreme frost breaks: then mark the places in the garden where these plants are to stand, and open a hole for each a full spade deep, and a foot wide. Take up as many plants as are wanted out of the nursery-bed; bring as much of their own earth with them as can be done conveniently; and set them upright in the holes, with the head of the root a little below the level of the surface of the border: close the earth well to them, and sink a small hollow about the head of the root. The ridge of earth round it will keep off the bleak winds; and if the weather should again set in severe, there may be a little bundle of dry pea-straw laid over each plant.

The morning after the planting every one must have a moderate watering. At the time of planting there must be some given, but that must be very little. These plants will require afterwards no other care

care than is taken of every thing else in the borders, and they will flower strong and well.

The great article is the care of those in the nursery, for the principal expectation is there. The beds must be kept weeded; and in very dry weather the plants must be watered. They will flower at their natural time, and the gardener will then know the value of the roots.

No plant should be suffered to blow more than four or five flowers this first season: this will be enough to shew their excellence, and they should then be cut down close to the ground for strengthening the roots. As they come into flower, the finest should be marked, by thrusting a stick into the ground near the root; and such as are very poor should be pulled up and thrown away.

In the beginning of October those roots which are marked for having borne fine flowers, should be taken up and brought into the garden. Large holes must be opened for these; and they must be taken up with balls of earth, and planted carefully. The succeeding year they will flower in their most perfect beauty, and the roots will have their full strength.

It is this year also that the plants ripen the most perfect seeds, therefore the very finest should be marked for that purpose.

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The ripening of their seeds will weaken the roots, but it is needful for a supply; and those which have been used for this purpose should be taken up, and others planted for the next year in their place.

Those plants which are marked for seed must not waste the strength of the root by too much blowing; a few flowers will afford a sufficient quantity of seed, and it will be much better, than when the plant is loaded.

These must be well watered while the seed is growing to its bigness; and after that they must have very little, and for the last days none.

When the husks are quite dry, the plant should be cut up, and laid entire on a shelf in an airy room to harden. After a day or two the seed-vessels must be taken off, and laid separate to dry a week: then the seeds should be shook out; and these should again lie about ten days. Thus they will be perfectly cured; and they should then be put up for winter. The following spring they should be sown exactly in the manner before directed; and this should be the course from year to year.

The old roots will flower very well two seasons more, but not equal to the first bloom; and much less to such as shall be produced

produced from the seeds of these. With the management here directed, the stock will be every year improving; and a very small piece in the nursery will supply these articles to the garden.

CHAP. IX.

Of the farther Culture of Biennial Plants.

THESE agree so entirely with the perennial in all respects, excepting only their duration, that the same management exactly serves them, all but in the last transplantation. They are to be raised as the others by seed sown in spring; and they are to be in the same manner transplanted out of the seed-bed into a second piece of nursery-ground; but they should be brought in time into the garden. If these plants be kept all the summer in the nursery-bed into which they were transplanted from the seed-bed, they will many of them flower in the nursery, which is not intended; for they are not strong the first year, nor is the nursery a place for the flowering of those plants whose roots perish. To prevent this there requires one transplantation more the first year for these than for perennials.

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When they have been raised in the same manner with those, and in the same manner transplanted out of the seed-bed into another part of the nursery, they must not be suffered to stand there till autumn, but brought into the garden during the forepart of summer. They will naturally be removed out of the seed-bed in May; and when they have stood about five weeks in the new ground, it will be proper to take them into the garden. This must be done with care; and it will secure their continuing without a stalk till the next year. Toward the latter end of June let a cloudy day be chosen; and open, in the borders of the garden, as many holes as there are plants. Take them carefully up with a good ball of earth to the root, and fix the new mould well about them. Give them a good watering; and repeat it every day: they will strengthen themselves by this means during the summer and the winter following; and having had eighteen months growth before they flower, they will blow in the greatest perfection. Few who are not accustomed to the arts of culture, can imagine the advantage of this method: I had the good fortune to see it two years ago in a very remarkable manner in the case of the common mothmullien in a garden near London.

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This is a wild plant in some parts of England, and produces under the hedges a long spike of handsome yellow flowers; but in the way I saw it raised it exceeded in beauty all the kinds we bring from abroad. Nature sows this plant in autumn, and it flowers the succeeding summer: the flowers ripen in July, and the seeds in August: these falling out as soon as the husks are dry, sow themselves in September, and the young plants appear in October, which flower the following July. Here is only a growth of nine months, from the first shoot to the flowering. But according to the method here proposed, we give the garden-plants of the same kind eighteen months; this is twice the time; the root has twice the strength, and the plant flowers with double beauty. The gentleman in whose garden I saw this plant in the summer of the year 1756, sowed it in the spring of 1755; the seeds were gathered from a wild plant the autumn before: they were sown in March, transplanted in May, and removed into the flower-garden about the middle of June; they flowered the July of the succeeding year. The flowers were as big as a crown-piece, and of a yellow that exceeded the ranunculus. Every body admired the plant till they heard it was an English weed:

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and probably the seeds of these fine plants
will raise a yet more beautiful progeny.

C H A P. X.

Of the Propagation of Flowering Shrubs.

THIS second general class of garden-plants being understood as to their easy culture, we may proceed to the propagation and management of flowering-shrubs; which tho' done various ways, according to their several natures, yet is in all very familiar. The ways of propagation and increase of these kinds are three, by suckers, layers, or cuttings.

Nothing could be more natural than that part of gardening which multiplies flowering shrubs by the suckers that rise near their roots: nature indeed makes the increase unassisted; the gardener only removes the new plant to another place. This was the first way of propagation introduced into our shrubberies; and from this came the other two. Where shrubs did not afford suckers, it was natural to try whether a branch buried in part in the ground, would not take root in time, and serve as a sucker: This was tried, and it succeeded; and thus came in the method
by

by layers. Long after this Lauremberg proposed the way by cuttings. People thought him mad for saying a piece of twig stuck into the ground would grow; but they found it true on trial; and it is by far the most useful method of all. As it is not universal, the others must on some occasions be still employed. We shall therefore propose them in their natural order.

CHAP. XI.

Of raising Shrubs from Suckers.

MANY of our flowering shrubs, and other kinds, send out a number of young shoots from the root, which would make, as it were, a little thicket about them. These are a deformity to the original tree, and they suck in that nourishment which should go to feed its flowers and foliage. Therefore they ought to be cleared away, though they were not wanted: but they are every one capable of growing into a new shrub.

The best time of propagating shrubs this way, is the middle of October. Suppose there is an old lilac in the garden, and that it is surrounded, as is naturally the case, with suckers, in October dig up a

small piece of ground in the nursery, and open with a spade holes at two foot distance every way, laying up the mould at the side of each hole. Then in the evening of a mild day take up all the suckers from the old plant, and chuse as many of the finest as are desired to be raised. The best are those which are straightest and thickest in proportion to their height, and such as have grown farthest from the stem of the tree: cut off the ends of the roots, and plant one in every hole, first throwing in a little of the loose mould from the side to make a good bottom. Drive in a fence-stake pretty close to each, and let it stand a foot and half out of the ground. Plant the sucker just as deep as it was naturally where it rose from the old root, and tie it to the stake in two places with some soft matting.

Thus plant the whole number intended, and then give them all a thorough watering. Repeat this every other day for a week, and they may then be left to nature. They will strike root during the remainder of the autumn, and will be found full of life in the following spring. All the care they will require farther is, to keep the ground weeded between them, and in very dry seasons to give them some water. They should stand three years in this bed, and they

will then be fit to plant in the garden. To this purpose they must be taken up at the same season, that is, late in autumn; the fibres trimmed all about the roots, and in planting the mould must be well settled round them by careful laying in, and by a good watering. A stake should be also thrust into the ground to tie them up; and if the weather be severe, the first winter some dry pea-straw should be laid about the roots, and kept down by pegs. This is the whole culture by suckers; and thus very fine plants may be obtained from many kinds of our shrubs; but not from all: therefore other methods are also necessary.

C H A P. XII.

Of raising Shrubs by Layers.

WHEN shrubs do not yield suckers, and will not take by cuttings, recourse must be had to laying. This may either be done from the branches of those shrubs which are kept for flowering, or from such as are planted for that purpose only, and are called stools.

This latter is the practice of nurseries where great numbers are to be raised for sale: the

other is more the purpose in a gentleman's garden.

There are two seasons for this work, the beginning of autumn, and early in the spring: the first is best for hardy trees, and particularly for those which hold their leaves all winter: the latter for the generality of the other kinds.

If the gardener has any of the more elegant flowering shrubs, which he intends to increase, the best method is by layers: and it should be done in this manner. Chuse out some of the branches which grow near the ground, or such as can be bent down to it with the least violence; and which have such a length that they can bear to be in part buried five or six inches deep, and have a piece of half a foot in length left above the ground at the end. Draw these down in the manner they will come most naturally to the ground, and make a mark along the part at which each lies; mark also the part of the branch that will be under ground in the laying. Then open as many trenches as there are branches to be laid, carrying them strait along where the marks were made, and opening each a full spade deep: let the mould be very rich, and well broke in the working. Let the trench be five inches deep all the way. Give each branch a slight twist

twist in the middle of the place where it is to be under the mould. This must be done in so careful a manner, as just to crack the rind, and no more. Then with a sharp penknife slit the branch thro' in the same place for an inch and half in length. Cut some hooked pegs to keep it down. Bring down each branch in a careful manner till it touches the bottom of the trench opened for it; and peg it fast in that place with one, two, or more of the pegs, according to the danger there is of its getting up by the spring of the wood: then cover in the mould, pressing it moderately close about the branch with the hand; and to finish all, give it a gentle watering. The next day water it somewhat more largely; and after this give it only the common care of the other plants. The end of the layer that is left out of the ground, will shew whether it continues in health; and all that is required more, is keeping the place well covered with mould; and in the dry time of the succeeding summer watering the ground at times: in the winter there will be very little need of this.

One year will serve in general for the giving them good roots. If the branches have been laid in autumn, they may be taken off from the old tree the autumn following; and planted in a nursery-bed,

bed, if they be slow growers; or if not, they may be at once set in the garden where they are to remain. Roses laid one autumn, and the layers taken up the next, will flower the succeeding summer; and so it is in many other kinds: but according to their natural flower growth others require more time.

If layers be desired from some curious shrub which has no branches near the ground, the method is this: Fix upon one more of the branches for laying, and by pulling them gently down with the hand, observe how far they will naturally yield; then set up a tressel under each branch, and place upon it a trough of wood a foot deep, filled with very fine mould. Let the tressel raise this so high, that the branch can easily be brought down to it; and raise as many of these as there are branches intended to be laid. Then twist and slit every branch as before directed; and lay it down in the trough so that it may be covered five inches with mould, and leave a piece of a foot long standing out. Fasten this down with sticks thrust across the trough, and cover the branch with mould.

This must be watered more regularly and carefully than layers in the open ground, because the small quantity of mould in the box would otherwise quickly dry. The
success

success of the whole depends upon keeping the earth moist: if it should be suffered to grow dry, even after the layer had shot roots, they would wither. If the care of watering be observed regularly, these layers will succeed as well as those in the common ground; and at the end of one year they may be cut off from the old shrub, and planted in pots, or in the open ground, according to their kinds. This method extends the propagation by layers to almost all kinds of shrubs and trees; and when it is well managed, it will always succeed.

C H A P. XIII.

Of raising Shrubs from Cuttings.

THE benefit of the method by layers is very plain; but the operation is tedious and troublesome. This has introduced the short and easy practice of raising shrubs from cuttings; and wherever it will succeed, it is greatly preferable to that by layers; because less time and trouble are required, and a much greater number may be raised this way than can the other.

Not only shrubs and trees, but all plants which have woody stalks, may be propagated by this method. It may be
done

done almost at any season of the year; but the best time is in May and June, that the cuttings may take root so as to be fit for removing before winter. There are few kinds which, being managed with care, will not succeed in this manner. All cuttings require shade and water; and the more tender they are, the more perfectly they must be sheltered. For the common kinds a small bed in the nursery, hooped over and covered with canvas, will answer very well. The more delicate will require to be covered with hand-glasses, or to have the assistance of a hot-bed. Those which will not strike by one of these ways, usually will by another; and there are very few that will not one way or other succeed.

In the middle of June let a piece of the nursery ground be dug up very well, and make a bed of three foot broad, and of such length as may hold the proper number of plants: have some hoops ready to place over the bed, and a piece of canvas to cover them: it must be so large as to cover the hoops entirely, and to fall over to the ground at each end. Then take cuttings from all the shrubs and plants intended to be propagated in this manner: Chuse the straightest, evenest, and most vigorous young shoots of the several kinds, and
cut

cut them off about seven inches long. Clip off the leaves from the lower part of each, and twist the bottom of the shoot: then with a fine awl pierce the bottom of the stalk thro' in several places up to an inch and a half height.

Plant these two inches and a half deep in the mould of the bed, at a small distance from one another; and continue till the whole number intended are in the ground: close the mould very well about them, and give them a good watering. Plant the hoops over the bed, and lay the canvas upon them; covering them entirely: thus let them stand the first night. In the morning lift up the canvas at one end, and along the sides, a little way from the ground: and keep it raised by bricks or pegs, that the plants may have some air, but no sun. In the evening lift off the canvas, and give them another watering.

This practice is to be continued; only giving them more and more air from time to time, till they have taken root. The mould must never be suffered to dry about them, nor must they be exposed to the sun; but the more air they have, after some days, the better. In this manner they will take root in six, eight, or ten weeks, according to their kinds: and then the greatest hazard

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ward is over: but they must still be shaded from the sun in the middle of the day, and watered frequently. In the beginning of September they must be transplanted, and they must then be removed according to their different degrees of tenderness or hardness into pots, or at once into the open ground: or by a milder course into warm nursery-beds that will raise them to more strength. It will be best to begin with the most tender. These must be potted: and for this purpose as many small pots must be prepared as there are of those plants, and filled with mould. The cuttings must be taken up one by one, and great care must be taken to take up a good ball of earth with each. They must be planted upright, one in each pot; the mould must be carefully closed about them, and they must be set in a warm sheltered place, and shaded from the sun by a canvas, or other contrivance. Here they must stand the winter; and as spring advances, they must be taken out of these pots, with the whole ball of earth, and planted in larger. The method is this: Have a set of larger pots ready, with a heap of good mould; put a little of the mould into the bottom of one of the pots, and shake out the whole ball of earth into one of the small pots; trim the fibres round the surface,

surface, set the ball upright in the larger pot, and fill in the rest with more of the mould. Change the pots off all the plants in this manner, and set them in the same place: shade them from the sun in the middle of the day, and water them constantly every evening. After this they will be soon established into good healthy plants.

This is the whole management of the tender kinds, which are kept in pots always, as Geraniums, and the like. A second sort are such as require shelter while young, but will bear the open air when grown up to some strength. Of this kind are the Cistus, called the Rock-rose, and the like. These should next be taken out of the bed, and they must be managed just as the former set; only that in the succeeding spring, when the others are put into larger pots to be kept for good, these are to be planted out into the borders. They must be taken out of the pots with the entire ball of earth, and planted upright with care, fastening the stem to a small stake thrust into the ground to keep it steady. They must be well watered till they have taken root, and they will then need no more care, but will grow up into good shrubs.

The third kind, which are hardier than these, but not absolutely suited to our soil

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as natives, should be next taken up, and removed into a nursery-bed. Of this kind may be reckoned the hardy shrub St. Peter's-wort, and some others. When the plants of the two former classes are removed out of the first bed, a place must be prepared for these: they need not have pots; but only require a good spot of open ground. Look out a shady and perfectly well sheltered part of the nursery, and dig up a bed a full spade deep, breaking the mould very fine. Open holes in this at five inches distance every way; then take up the plants each with a ball to its root: place one in every hole; and keep them perfectly well watered till they are established in the new ground: then leave them to nature. Only if the winter should prove extremely severe, shelter them a little in the worst weather.

In spring take them up with large balls of earth to the roots, and plant them in the garden in the places where they are to remain, watering them constantly till they are new rooted.

Last of all take up the plants of the fourth or hardiest kind, and plant them at once in the borders. The *Althæa Frutex*, and some others, are of this kind. Let holes be opened in the borders where they are to stand; take them up one by one, with good balls to the roots, and plant them in these openings; water them every day

day till they have taken root, and they will succeed without farther care.

Here is a plain and easy method by which a garden may be stocked with all the kinds of flowering shrubs almost without expence. Cuttings may be had from any garden : and one bed raises them all : they are all to be transplanted from thence at one time ; and the same method of culture afterwards raises them to perfection. Thus easy is gardening when the principals are once perfectly understood.

C H A P. XIV.

Of the raising of fine Flowers.

THIS is the culture and management of the three great classes of the garden-plants, which are to furnish the clumps and borders of the pleasure-garden; but the management of what are called FINE FLOWERS is yet behind. These are the proper furniture of that peculiar part of the ground which we have distinguished from the rest by the particular name of the *Flower-Garden*. These are the darlings of the perfect gardener, the pride of his art, and glories of his collection. Where the more ordinary kinds are raised, these
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should not be omitted ; and indeed if there be no particular regard paid to the express flower-garden, yet they should be raised for the farther decoration of the clumps and borders. Where there is a particular spot for fine flowers, the inferior kinds will be still beautiful enough for the pleasure-garden ; and where there is no such particular spot for flowers, all should go to the other. These are the most elegant productions of the gardener's art. These depend for their excellency upon the same principles of culture, tho' more time and care are required in raising them, than the other kinds : and it has appeared most proper to treat of them last, because they will best be understood after the others.

The common gardener is content to raise these flowers from off-sets, or from parted roots ; but this deprives him of all possible means of improvement. There requires time in the raising them from seed : but the trouble is very little ; and this is the way by which new kinds are obtained. We propose taking off a great deal of the trouble of gardening, and yet directing the reader to the full knowledge of the art. We shall therefore give the plain method of raising these elegant kinds from seed, and bringing them to their highest perfection : and this method is so far the same for all
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the several kinds, that one care, and one piece of ground, may serve for the whole collection.

The flowers of this kind may be reduced into two classes; 1. The fibrous, or tuberous; and, 2. The bulbous rooted. The first kind comprehends Auricula's, Ranunculus's, Anemones, and the like: the latter Tulips, Hyacinths, and those others which have grassy leaves. The culture of each of these flowers is delivered separate by those who have written on this subject hitherto, and a different kind of mould is directed for the reception of each seed; but I have found that one kind of earth serves them all, and one method of culture.

C H A P. XV.

Of sowing Fine Flowers.

PREPARE the mould for these flowers thus. Pare off the turff in a dry piece of rich pasture ground, and dig up the mould as deep as it goes; this is usually one full spade's deep: take care to go no deeper, and not to mix any of the bottom with it. In the beginning of March dig up five loads of this; mix with it three loads of river-mud, one load of old cow-dung,

and the same quantity of rotten mould dug up where an old faggot-pile has stood. Sprinkle over this four bushels of flacked-lime, and a pale-full of brine made of a peck of salt.

The quantity may be larger or smaller, according to the number of plants intended to be raised; but this is the best proportion: let it be all well worked together, and thrown thro' a coarse skreen; and thus let it lie till May: then turn it very thoroughly again: it will also require another turning in July, and this will compleat it for service.

Procure seeds from some person on whom you can depend; they must be saved from the finest flowers that ripen any, for some of the very finest do not; and laid carefully to harden. Each parcel must be put up separate, and laid by till the latter end of July.

Then chuse a part of the nursery which is open to the south-east, and skreened from all other quarters: dig away the mould, make up beds with that which has been all this time preparing for that purpose, and mark them number 1, 2, 3, and so on. Each must be a yard wide, four inches deep in mould, and laid a little rounded. When these are all ready, begin sowing. Rake off an inch of mould from the surface of the first bed; mix some of it with the seed intended to be sowed, and scatter

scatter it on evenly in the evening of a mild day. From the seventh to the seventeenth of August is the best period for this service. Sift on as much of the mould that was raked off, as will cover the seeds a third part of an inch, and lay a piece of thorn-bush upon the bed. Thus far it is the same with the method of raising the common perennial plants. It was before observed, that the difference is only in point of time and care. Sow every seed in this manner, and finish all the beds.

The seeds of these choice flowers are usually sown in pots and boxes; and the common writers on gardening give that direction. I have tried both, and find the open ground is best. The earth dries too fast in these small parcels; and the seeds grow better when they have the vapours from the open ground.

Once in three days water the beds in this manner: Lift off the bushes, and lay a piece of old matting over the bed. Water upon this lightly and carefully, and when the wet has got through, lift it off, and so water the next. The ground will thus be moistened without disturbing the seeds. If gentle showers fall naturally, these waterings may be omitted; but if heavy rains come on, some mats or cloths must

be laid over the beds upon the thorn-bushes, to keep off the violent force of the drops.

A very small piece of ground will answer for this, and therefore the care is easy. Writers direct a different time for sowing the several kinds, but this season with this method suits them all.

The young plants will appear at various times; but the dangers to which they are exposed are the same, and one kind of protection is required for them. No weed must be suffered to grow upon any of the beds. When the plants rise very close, some may be pulled up and planted in a more vacant place. When rains fall heavy, mats must be laid over the thorn-bushes; and as the frosts come on, the same care must be used to guard against them. In severe weather the beds must be kept covered up entirely; but when it is milder, they must have the free air of the middle of the day. Towards spring a reed-hedge must be set up to the north-east of the beds, to keep off the nipping winds from that quarter. Thus they will be kept till the beginning of the spring; and they must then be gently watered at times; and if the noon-day sun appear to have too much power, they must be shaded from it.

Thus

Thus all the kinds will be kept in good condition till about June the next year; and at that time the Auricula's and Polyanthus's which retain their leaves, must be transplanted. Another bed like the first must be prepared for them, and they must be set at four inches distance one from another. They must be watered carefully, and shaded till they have taken root. After this no more is required than to keep the ground clear from weeds; and thus they will be gathering strength till the next year.

These being removed, the other beds must be examined. The leaves of the young Anemones, and the rest, will now be decayed; they must be clipp'd off, and the surface of the bed laid smooth, and a little of the same mould sifted over the whole, about a third of an inch in thickness. Thus they must remain till autumn, keeping the surface clear from weeds. At the beginning of October sift another new coat of mould over them, of the same thickness with the former, and take the same care of the beds this as the former winter: only as the plants are stronger, it need not be so strict. The plants which have been removed into the nursery-beds must also be sheltered during severe weather in the depth of winter, and the surface of all the beds must be kept clean from moss.

Thus far the culture of all these plants is the same: but as some of them are afterwards to be taken up at certain seasons, and treated in a manner different from those whose leaves remain all the year, it will be proper to consider their management in the rest of their growth, under the three distinct heads of the fibrous, tuberous rooted, and bulbous plants: for according to this distinction of the roots, the management of them varies in the succeeding time.

C H A P. XVI.

Of the raising of fibrous-rooted fine Flowers.

OF this kind are the Auricula and Polyanthous Primrose, with the like: the root consists of fibres, and therefore does not admit of being kept any time out of the ground. On this depends the particular management of these plants.

The raising all the kinds from seed being alike, that has been directed already. What we here call their farther management, regards their flowering. The Auricula being the most excellent of these, its culture may serve as a direction for all the rest: the principal difference between this and the Polyanthus, is, that the Auricula

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is kept in a pot, and the other in the open ground.

The Auricula seed has been sown in August, the young plants have been removed in the June following, and are now, we suppose, in the nursery-bed into which they were set at that time. They are to remain there till the following spring, and the greater part of them will then flower. They will not blow fine, because they stand close; but it will be easy to see which will make another year the best flowers.

The plants, in this nursery-bed, may now be distinguished into three kinds; 1. Those which have good flowers; 2. Those which have ordinary and indifferent ones; and, 3. Those which yet shew no bloom. Many of these last will prove the finest of all. Mark the several sorts with three kinds of sticks, and thus let the bed remain till the middle of July; then manage the plants according to their value. First take up all those which have borne ordinary flowers, and plant them out in the borders of the garden. Then prepare as many pots as there are plants which have borne fine flowers, and take these plants up carefully with a ball of their own earth: plant them in pots of the same mould, and give them a gentle watering. The plants which have not
yet

yet flowered, may now be left in the bed without removing: they will stand the more free and clear for this taking away of the others; and they will gather great strength the succeeding spring.

The beds must be kept clear from weeds, and the mould sometimes broke between the plants: if the autumn prove very dry, they must at times be watered; and a mat may be drawn over them in the severity of winter.

The plants in the borders require only the common care of every thing else that is in the same place; but those which are potted must be managed more delicately. Set the pots under the shelter of a wall, or building defended from the north; and let there be a shed carried over them to keep off rain and too much sun. Here let them stand all winter. In the middle of February bring in a quantity of the same mould, pare off the surface of the earth in all the pots an inch deep, and fill up the place with this, giving them now and then gentle waterings. If the frost be severe after this, there must be a canvass drawn from the edge of the shed to the ground, in front and at both ends. This must be let down in an evening, and taken up two hours after sun-rise.

Thus

Thus they will be preserved in the bud, and they will flower in perfection. When they blow they should be removed to a stage of shelves one above another, and open to the south-east.

Some will now appear less valuable than was expected; and let these be put into the borders of the garden. Others will be much finer: These last must be marked for increase. Seed must be saved from them for another sowing; and the off-sets carefully removed and planted in other pots, where they will make so many good plants. The time for taking these off is the beginning of April; and they must be managed just as the others.

The roots left in the nursery-bed will now flower, and the best must be marked. These must be put into pots the July following, and the others planted in the borders of the garden. This is the whole culture of the Auricula: and thus all the fibrous-rooted choice flowers are to be propagated.

C H A P. XVII.

Of the raising of Tuberous-Rooted Flowers.

THE Anemone, Ranunculus, and some other kinds, have roots of a thick

thick solid substance, and irregular shape, nourished by fibres. These are called tuberous roots. They contain the rudiment of the plant which is to flower the next year; and they have so much substance to defend it, that they may be safely taken up after the flowering season in spring, and kept in a dry place till autumn. This gives an advantage to the flowers; and on this depends their particular management.

We shall here take the *Anemone* for an instance. The seeds were sown in August with the others; the young plants took their growth together the first spring, and they have been refreshed and sheltered by a new coat of mould in summer, and by a second in autumn. There we left them, and we are now to pursue their particular management. They must have some shelter if the winter be severe, and in spring they will shew themselves above ground in larger and much stronger leaves than the first.

Defend them well from the north and east; give them gentle waterings, and many of them will flower. Mark the roots into three kinds, as the *Auricula's*: 1. Those which promise fine flowers; 2. Those which seem indifferent; and, 3. Those which have not flowered.

When

When the bloom is over, the leaves will soon decay. Toward the end of May they will be in a manner gone: then look over the bed, first taking up those roots which were marked for fine flowers: clip off the remains of the stalk and leaves, and wash off the mould, and spread them upon a piece of canvass stretched above the ground in an airy room, where there is no sun.

Next take up the roots of the more indifferent flowers, and clean and dry them in the same manner. When they are very dry, put them up in separate parcels, and keep them safe till autumn.

Leave those roots in the first bed which have not yet flowered.

In the middle of September make up two beds of the same mould, raise them five inches above the surface, and round them at the top. When the mould has lain a week to settle, dig it up again, level the surface as before, and plant the roots; the fine ones in one of these beds, and those of an inferior kind in the other. Plant the roots two inches deep, opening the surface for this purpose with the point of a trowel; and cover them carefully with the mould. They should stand at five inches distance one from another.

If the winter should be very severe, the beds must be sheltered in the worst weather.

ther. In spring yet more care is needed, for these roots, being planted early, will soon shoot for flower; and nothing is so injurious as frost, or sharp winds to the bud. There must be hoops placed over the beds, and canvasses drawn over them in the bad weather. They must now and then have the benefit of watering, and always be open to the noon-day sun, which at this early season will have no power to hurt them. They must only be covered in bad weather, for the more air they can have safely, the better they will blow.

It will be now seen which are the finest flowers, for there is no certainty in the first blowing: not that the finest of the former year will grow worse, but many of the second bed will shew themselves much better than they promised. No Anemone has its full strength till the second year's bloom, and no judgment can be formed of it till that time with certainty.

The roots left in the seed-bed will this year also flower; they must be marked by two kinds of sticks, and afterwards taken up and managed as the others.

This is the whole culture of the Anemone. Every summer the roots are to be taken up and dried, and every autumn planted. They will increase; and the separated parts may be raised to flower like the

the off-sets of Auricula's, or other plants: and thus there will be a continual enlargement of the quantity. But the way to raise new and fine kinds must be by sowing. Therefore as double Anemones do not ripen seed, it must be saved from the single ones; many of these appear with the double; and some of the best plants must be preserved for this purpose. The trouble of sowing is so little, that it may very well be repeated every year.

C H A P. XVIII.

Of the raising of Bulbous-Rooted Flowers.

THESE have a large roundish root, composed of a solid fleshy substance, or of many skins one over another. The rudiment of the future plant is preserved so well in these, that they may, as the tuberous ones, be taken up after flowering, and kept out of the ground till autumn. This is of the same advantage to the flowers as in the other instance; and the management is in a great measure the same; only the seedling plants are much longer before they flower. This makes the practice somewhat different. We shall select the tulip for an instance.

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As we directed all the seeds to be sown at the same time in separate beds in the nursery, we are to suppose tulip-seed had its place among the rest. These seeds have been sown in August. The young plants will appear the following April like blades of grass; and these first leaves will fade in about five weeks. The surface of the bed should be then cleared of all young shoots of weeds or moss, and some fresh mould sifted on to cover it a third of an inch. In September the surface must be again well cleared of every foulness, and a new coat of the same mould sifted on of the same thickness. All this time, and all the following winter, the minute roots will be gathering strength. In spring they will again shoot up small leaves: these will fade as the heat of summer comes on, and then the roots are to be taken up. This must be done with care, for they are yet very small.

A new bed must be made for them, and this should be five inches thick in mould; the bottom should be the natural earth, well rammed, that it may be even and hard: the roots must be planted in this bed when they are taken out of the other, which will be about the beginning of July. They must be set at three inches distance,
and

and covered an inch and a half above the crown. At the latter end of September, a fresh covering of half an inch of the same mould must be given them, and the same early in the spring. After this the bed must be watered at times; the leaves will appear again in March, and fade about July: then a fresh coat of half an inch of mould must be laid on, and the same again in autumn. The next summer they must have just the same management; and in the summer of the succeeding year they must be taken up again.

The roots having now four years growth, will be of some considerable size. A new bed must then be made for them just as the former, only two inches deeper in mould. They must be planted in this three inches deep from the crown to the surface, and they must stand six inches asunder.

They must remain two years in this bed, keeping the surface constantly clear from weeds, and giving them a new coat of mould every summer and autumn.

This brings them to their perfection, and the next year they will flower. Some will blow sooner, but they will be the worse for it.

The roots must be taken up in the summer of this last year, and laid on a canvas to dry. They should be kept out of the

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ground

ground till autumn, and then planted in beds of the same mould two foot deep, rounded at the top: the roots must be planted seven inches deep, and ten inches distant from one another. The next year they will blow in perfection as to shape and bigness; but they will not come to the beauty of their colours till after one or more years of farther growth.

Every season the roots must be managed as already directed; and in every summer's blowing there will be some seen broken into stripes. These must be marked when in flower, and the roots separated from the others when they are taken up: they must be planted in particular beds; and they will make by degrees a fine collection.

This is the culture of the tulip, the most delicate of all the bulbous roots: and thus that flower will be brought to its highest perfection. The time of its growth is long; but the trouble is very little.

C H A P. XIX.

Of the Green-House and Stove.

WE have thus gone through the absolute course of gardening, so far as it relates to the kitchen-ground, the pleasure-garden, the nursery, and that peculiar favourite

vourite spot the-flower garden ; and this in general is what constitutes the whole, except what relates to fruit : but as many are now fond of plants from hot climates, which cannot be raised or live in open air with us, we should leave the garden imperfect, if we did not add the management of the green-house and stove. These being articles absolutely distinct, must be treated separately ; and as the green-house is much the simplest and easiest, we shall first give the construction of that, and the management of the plants it contains.

C H A P. XX.

Of the Green-House.

TH E proper place for the green-house is a warm and well sheltered part of the garden, open to the south ; and for the pleasure it affords the eye at all seasons, it should not be far from the house. Its front must be full south ; and as much as possible of this must be glass, the windows large, and the partitions or piers between them small. The influence of the sun is so much depended upon in this case, that the green-house must be a kind of gallery, long, lofty, and not deep.

The best measures I have seen are these; twenty feet in height in the clear, and eighteen feet in breadth. As to the length, it is not material; but must be suited to the number of plants. It is a custom to have rooms over the green-house, but it should never be practised by judicious persons; for it makes strength in the piers necessary, and this makes them necessarily thick, which is utterly against the very design of a green-house; behind it indeed may be sheds for tools, and other conveniencies; and if there be stove-plants raised also, it will be very convenient to have two stoves instead of one, which may be annexed to the two ends of the green-house; and being lower buildings, will give an air of grace to this, and be also useful, for there may be a flue from the fire-place of each stove, carried under the floor of the green-house; which, though usually kept shut, may in extremely severe weather be opened; and thus a light degree of warmth may be given to the air of the green-house, without trouble; which will save the shutting up all windows, and burning of candles in it, as otherwise practised in extreme cold. The first of these always hurts the plants, and the latter is often ineffectual.

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The soil of the spot where the greenhouse stands must be perfectly dry; and the floor raised one foot above the level of the ground. The back-wall must be carried up of solid and good brick-work; and in front there must be raised also a wall of eighteen inches high, of the same materials. This serves to receive the sash-frames, and will not keep any sun from the plants, because their pots even in the front row rise nearly to this height; and those behind being upon stands are much higher.

The piers which rise from this low wall, for the support of the roof, and reception of the frames and shutters, must be made of the hardiest and finest brick; for the more strength there is in the materials, the less thickness there need be in the piers themselves. When good bricks are used, they need be only thirty-two inches broad in the front, and they should be sloped off inwards to fourteen inches, which will give the sunshine free passage in at all angles. These piers must be raised at seven foot distance from one another all along the front; and then the frames for the sashes must be let in. These must be of sound and well seasoned timber, and must rise to the roof within about a foot, which will allow for the necessary timber of the roof and cornish. The sash-

frames must be of the same sound timber; and must be very carefully fitted in for closeness of the joints, and for easy motion. The larger and fewer the panes, the better; and the wood-work should be turned the narrow way to the light, as is now the custom in common sashes.

Shutters of seasoned wood must be fitted to the sashes, in such a manner as to close easily, and meet quite over them when that is required; and at other times to fall close to the slope of the piers, so as to obstruct as little as possible the free course of the sunshine.

The floor should be paved with thick tiles, and the flue should be about a foot wide, and of the full depth from the surface of the floor to the natural ground: it should run the whole length of the building, at about half a yard from the front-wall, go under the ends at the same distance, and return at two foot and a half from the back. When there is a stove, it should open into this; and when there is only a green-house without stoves, it should open into some one of the sheds erected behind the green-house for tools, where they may be a little fire-place; and the vents should be by two small chimnies, rising between the green-house and this tool-house. This provision of flues is very necessary:

necessary: for tho' it will seldom be wanted, yet where it is, the whole quantity of plants will sometimes be preserved by it in mild winters. No use is to be made of them, but when there are very severe frosts; a small fire answers all the purposes of security to the plants, much better than any other method whatsoever. The roof must be covered with good sound tiles, and these very well and close laid on: the cieling must be covered on the inside with a good thickness of reeds laid even upon the rafters, and covered with a coat of good mortar; these will perfectly keep out the cold from the top. The walls and cielings must be covered with coarse but strong stucco-plaster for the same purpose, and very well white-washed. Thus will the room be finished: its furniture is a parcel of treffels for the pots of plants to stand upon; these must be brought within a yard and half of the front, and the same of the back and ends, and must be covered with good plank, and rise one above another backwards.

Thus there will be a conveniency of setting all the plants clear of one another, according to their sizes; and a free space for air, and for the person who is to take care of them to go round them. The smallest and lowest plants must stand forwardest, and the taller gradually back-

wards, according to their height. The stems of these should be tied by the heads of those before them; but their heads should be quite clear.

It will be a great convenience if there be a basin for water in some parts of the ground just before the green-house, for watering the plants; not only because it will be always at hand, but because the water being exposed to the full sun, and sheltered by the building, will always be of the same temper of warmth, nearly with the air of the green-house, and with the plants themselves.

I am sensible that in some points these directions are not according to the general practice: but reason dictated them, and experience has confirmed them. In the main points all are agreed; but even these which seem to be of less importance ought to be carefully regarded, for the least things in so tender a point have their weight.

It is usual to direct the piers to be of stone; and perhaps where there is a building over the green-house, this may be proper, because there is the more strength required; and if brick were used, the weakness of the material would require to be compensated by a large quantity, and that would thicken the piers, and obstruct more

more of the sunshine: but in the way here directed, when the piers have nothing to support but their part of the roof, they require no great strength; and brick is a material that receives and retains warmth, and is dry; whereas stone-work is always cold and damp, which are two things to be most carefully guarded against in a green-house.

The floor is usually directed to be paved with Purbeck or Norway stone; but the same reason holds against this: it will be naturally cold and damp; and, on the contrary, there is the same warmth and dryness natural to tiles that is to bricks, and they are so much the better suited to the purpose.

Some use furze or heath to cover the cieling, or lie between that and the roof, to keep out cold; but these do not lie close, and therefore are less fit for the purpose: for a small thickness of reeds, which being round and smooth may be laid even, and without any great openings between them, answer the same purpose as a much greater load of the others. The white-washing, and stuccoing the walls, is very important, for the stucco stops all entrances of cold between the bricks and mortar; and the white-wash reflects the full light of the windows upon the plants; and this has
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of late been discovered to be an article of vast importance.

The green-house thus constructed will preserve all those plants thro' the winter, which bear the free air with us in summer; the whole orange and lemon tribe, the geraniums, and a multitude of others. But the singularity or beauty of some plants from hotter countries, which will not bear the air with us at any season, and above all the delicacy of the pine-apple, which is as tender as any of these, have led us to erect stoves, where the air is at all times kept at a degree of heat equal to what those tender plants require, by the means of tan-beds, and of actual fire added to the most perfect exposure to the sun. The construction and management of these is the nicest article of all gardening; but with due attention it may be understood from a few plain directions, which we now shall proceed to deliver in their order.



C H A P. XXI.

Of the Construction of a Stove.

STOVES may be constructed either with or without pits or beds of tan-ners-bark, and they take from this a different denomination: those with these beds of tan, are called bark-stoves; and the others dry stoves. Of these the stoves with bark-beds are greatly the best; the additional trouble is not great: and as they have all the conveniencies which the dry stoves have, and some which they have not, that are very important, we shall advise all who build this kind of convenience to chuse these.

The place where a stove is built, must be perfectly warm, and well sheltered from the north; it must be open to the south, and the soil must be dry. The bigness must be proportioned to the plants; but we may consider those which are very extensive, as a number of stoves placed one by another, rather than one building of that name; and it will be best to construct them with that view.

There is a certain quantity of air or space, which one fire-place with its flues
can

can properly and conveniently warm ; and this should be the real extent of what may be called a stove. Experience shews that the length of such a building should be about six and thirty foot ; and consequently where greater extent is required, it will be best to consider the building as a line of two, three, or more stoves, each of this regular bigness, and each having its own fire-place: the walls may be one continued piece of brick-work, and all the rest continued in the same manner, only that every five and thirty foot there must be a partition run across the building ; and this should be of glaizer's work, that the light may be continued thro' the whole ; and the partitions should be constructed of moveable parts, to slide and open one into the other, as there may be occasion.

This will give a great advantage ; for the several plants which require a stove, will bear, and indeed in some degree require, different degrees of heat ; and these may be placed according to that rule, in one or other of the divisions, and the heat be a little more in one, or a little less in another, according to their nature.

We shall therefore consider the whole building as a range of six and thirty foot stoves ; and give the manner of constructing

structing one such, which will be a rule for the others.

To erect such a stove, first mark out six and thirty foot for the front-line, and raise a brick-wall fifteen inches high of sound and good brick-work. This is to support and receive the frame of wood-work for the glasses. Fourteen foot from this front-wall must be the place of the back-wall, and within the space between is to be dug the pit: first set off two foot three inches from the front-wall; this is to be the place where the gardener may walk before the plants in the bed, to manage them: at the edge of this space draw the first line for the front of the pit. Measure seven foot eight inches from this toward the back, and there draw another line; this marks the breadth of the tan-pit: its length is to be equal to that of the building within four foot, which is to be allowed in a two foot walk at each end of it: two foot two inches behind the back line of the pit draw another parallel with it, and the space between these is the walk behind the plants: thus there will be a pit marked out, with a narrow walk before, behind, and at each end of it; and there will be still the due space left beyond the back-walk, that is, between that and the wall, for the flues.

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The dimensions of the pit being thus marked out, the labourers may be employed to dig it. It must be two full spades depth, and all the mould must be cleared away; the bottom should then be strewed over with dry ashes, and these well rammed down. The sides and ends must be wrought up with a good brick-wall of nine inches thickness, and this must be carried up so high above the level of the walk, that there may be three foot in the clear depth for the tan: but this part of the wall which is above need be only four inches in thickness.

The top of this wall is to be covered with a piece of oak timber well seasoned, which will secure it from breaking by any accident; and will serve also to receive such uprights as may be convenient from that part to support the structure above. This is the best ground-plan of a stove, intended for a variety of plants, and a regular and easy culture; but where the purpose is less general, there may be a greater extent given to the tan-bed, by allowing no walk in front nor at either end; for the pathway behind may be made to serve the purpose above, but is always best to have the full conveniences.

The back-wall of the stove should be about fourteen foot high, and it should be
very

very substantial: the best way is to allow it two bricks and a half thickness. There will be space left between this and the back-wall for the flues, which should be sufficiently capacious, that they may not be liable to smoak.

The top of the wall raised in front must be cap'd with solid oak, as the wall within: but this must be a larger kind of timber, and well laid, for upon this is to rest the weight of the front of the stove.

From this plate of solid timber must be raised a number of sound and strong perpendicular bars. These must be about eight foot high, and they should be placed at four foot and a half distance one from the other. Between these are to stand the glass-work, which form the upright of the front of the stove.

On the top of the back-wall there must be in the same manner a cap or crown of solid timber; and from this to the upright of the front are to be laid the sloping glasses, which make the top of the stove. These are not to be carried quite to the back-wall, because the flues and the back-wall need not have this expensive covering; but the crown over them is to be plain timber; and into the front-edge of this the glasses which make the top are to be received. The degree of slope these glasses have,

have, should never be less than is here allowed: they may have considerably more at the pleasure of the owner; and the stove may also be raised higher, if the intention be to raise in it the taller plants; or the top being of glass-work, there may at any time be a part of it raised at a moderate expence, to give free way to the head of any particular fine and tall plant. This was the method taken at the late Lord Peter's, for giving room to the vast popaya, which by that means flowers the first in Europe, and shewed something they did not know in its fructification. But we have an instance at this time, that the great height to which that plant grew before it flowered, is not essential to the flowering; for last year there were two or three of them in flower and fruit at Sion-House, in a stove of the lower kinds; and the plants I believe not more than seven foot high.

The flues must be placed along the back-wall one over the other; the lowest should be two foot in the clear, the second eighteen inches; and the others gradually smaller, till the uppermost is but one foot. There must never be less than five of them; if there be six, seven, or eight, it will be so much the better. The top-flue must terminate in a chimney to carry off the smoke: and the great care is, that the heat be

be all detained in this return of the flues, and not wasted by a too sudden discharge with the smoak: the number of flues prevents this, and their bigness will keep them from growing foul too soon with the smoak.

At the mouth of the lowest flue, where it opens outward thro' the back-wall, must be the fire-place or furnace of the stove. There will naturally be sheds along the back of the stove, and this must be in one of them. It should be near the end, or at the end of the building; and must be so built as to keep up as regular a fire as may be, not heating the air violently at one time, and scarce at all at another; and it must not consume too much fuel.

The common firing is sea-coal, of which the ordinary small kind answers best. In Holland they use turff, and nothing answers better; therefore, if any gentleman has a stove upon the edge of the fens, or near good water-carriage from the turff-pits, it is the most adviseable practice of all to use this material.

A great care in the erecting this fire-place must be to contrive, that all the heat of the fuel is sent inwards, as 'tis there only it is wanted: the first provision is to let the oven of the fire-place be within the stove; and the next is to guard against the loss of heat in the shed, by a good thick wall. The best is made of a

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large flat stone, such as is used in paving; with a brick and a half wall built up in the common way, on each side of it: so that the wall will be of a great thickness, and lined as it were with stone.

The height of the fire-place is given by the place of the lowest flue, which must always be just upon a level with the surface of the bark bed.

The glass top of the stove must have the convenience of being sheltered when there is occasion; and the best method is by means of wooden shutters, which may be contrived to slide, and be moved without great labour in stoves not too high. A coarse canvass may also answer the purpose, and will be much more manageable, because it may be made in lengths, and wound up on rollers; and these being fixed to the crown piece at the top, may be managed at pleasure by slight pullies, with strings within reach below.

In all heavy rains these coverings must be let down to keep out the wet; and in hail storms to preserve the glasses, also in severe frosts to keep out the cold: and for this purpose they should be so long, as, when fully let down, to cover not only the top of the stove; but the front, and to hang down quite to the ground. The expence of these will soon be returned in the fuel that will be saved by it: for in the hard seasons

seasons the shutting up of the stove within this cover will make a very small quantity of fuel warm the enclosed air sufficiently; the heat of the tan in the pit also answers the purpose of no small absolute heat from fire; and when a stove is well constructed, by one or other of these assistances, the air will be kept in a due state of warmth for a very great part of the year, with scarce any thing of expence in firing.

The top of the range of flues in such a stove as this, is a very warm and excellent part of it, for particular uses: many very tender plants live excellently there; and those who do not raise stoves purposely for particular products, may have melons very early by means of boxes of earth placed upon this part of the stove; only taking care to keep it from burning the mould at the bottom of the boxes. The several other parts of the stove will raise and preserve plants of various degrees of tenderness; according to the different distance at which they are placed from the flues, and from the fire-places; but the great resource of all is the tan-pit.

The dimensions of this we have given, and are now to consider the method of filling it.

The tan used by gardeners is the refuse bark of a tan-yard, that which the tan-ners have used, and throw out of their

pits. This is originally oak-bark, ground and broke to pieces in such a manner as to make it readily give out its virtue to water. When the tanners have extracted this virtue, they draw it wet out of their pits; and it then will ferment on being laid in a quantity together. This fermentation creates a heat like that of dung; but it comes on more slowly, continues more regularly, and is much more lasting. Therefore it is an ingredient perfectly fitted for the pit of the stove, because the pots in which tender plants are placed can be set up to the rim in it; and this will give at once a kindly warmth and moisture to the pots and mould, while the air of the stove is of a like temperature for the rest of the plants.

As the bark is broke or ground to various sizes for the several purposes of tanning, there is a great deal of difference in its effects in the gardener's profession. The great rule is this: the largest and coarsest tan is the longest in heating, but it heats the most violently; the smallest heats soonest, and is slightest in degree: on the same principles the heat of the large tan lasts longest, and that of the smallest is the soonest over.

Moderation is the best of all rules; and therefore we shall advise the gardener to chuse tan of a middling size; and to mix
among

among this some of the smallest, because that will bring on the heat soon; and as there is the largest kind to support it, it will not go off. The larger kinds of tan may also be mixed with the others upon this method; and by knowing the quantities of the several kinds, single and in combination, various ways with one another, the bed may be contrived for any degree of heat, and almost for any continuance of time; there may also be a management of the pots themselves to favour the various degrees of heat in the bed; for when the degree is too great, the pots may be only let in a third part of their depth; whereas when it is of a due standard, they must be kept up to the rim in it; and watered from time to time, to allow for their growth, and waste by perspiration.

The tan should be taken fresh from the tanner's pit, and spread upon the ground to drain. Then it should be raked up in a heap for a little time, and drain somewhat more, and then be thrown into the pit in the stove; it must be thrown in light, and suffered to lie as it falls, for if it be beaten down and trod in, it will not heat regularly. When it falls light in this manner, the fermentation comes on regularly, and therefore continues. It will be in very good condition four months, if

the air of the stove has been kept all that time in a right temper; and in any case it will be good toward three months; at the end of which time, if the heat is found to decline, there requires nothing more than to take out the pots, and dig up the bark with a fork; or at the utmost only to do this with the addition of a small quantity of fresh bark, and it will keep in a due temper again for a great length of time.

When a new bed of tan is made, the pots must not be let into it, till it has got to a due degree of heat; this comes on slower and quicker, according to the condition of the tan; sometimes in ten days, sometimes not till a fortnight, three weeks, or even longer than that. The way to know when it is of a due degree of warmth, is by plunging sticks into it at the first mashing, and these may be examined by pulling them out, and feeling them from time to time.

When the heat is sufficient, the pots are to be set in; they may be placed close to one another; but care must be taken in putting them in, not to tread down the tan, for the reasons before mentioned; a stout board should be laid across for the gardener to stand upon, while he puts in the plants which stand about the middle of the bed; and

and he must stand upon one or other of the paths, not upon the tan, while he puts in those at the sides. It will be best in a new bed, not to put the pots in their full depth at first, but the half or two thirds, and afterwards to let them into the rim.

This is the general construction of a stove, and its several parts: the management of the plants will be best understood by instances; and as the pine-apple is a very considerable object, to all who have this convenience for raising it, we shall give its culture, and that of a single exotic plant, at large; by means of which the whole management of the stove will be understood: as every article relating to it may be referred to one or other of these kinds. The same method we shall take to explain the management of green-house plants, selecting the most universal of them all, the orange-tree; and with this it will be proper to begin, as its management being one remove above the hardy plants, will tend to the management of the stove-plants, which are yet greatly more tender.

C H A P. XXII.

*Of the Management of Green-House Plants,
illustrated by the Orange.*

THE green-house is not a place for the raising, but the preserving of plants during winter: therefore whether these plants are raised from cuttings at home, as is the case of the geraniums and the like, or imported at a considerable size from abroad, as orange-trees, their management in the green-house is the same; and one instance may serve for all.

The best earth for the orange-tree, and others of its kind, is good light pasture-mould, mixed with one fourth part of old cow-dung, and half as much pond-mud. This should be piled up in a heap, in the outskirt of the garden, and lie a whole winter before it is used; if longer, still the better: only it must be often turned to keep it from weeds; a parcel of this should always be kept in readiness for use. The orange may be budded on citron stocks raised here for that purpose; but the readiest way is to buy the trees of a good size from abroad; and there are vast quantities annually brought into England for sale.

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These should be chosen sound and fresh, and bought of a person, if possible, in whom there may be some confidence reposed: but there are also a way of knowing the condition of the trees by their aspect. They are brought over without leaves usually, but a judgment may be formed of them by the condition of the roots, stems, branches, shoots, and places of budding. The roots must be firm and sound, the bark of the stem and branches plump and tender, the shoots short and strong; for the long shooting trees are usually the chaddock kind, or the citron, which, tho' stronger trees, are less valuable in their flowering. The tree should always be chosen also with two buddings, for there will thus much sooner be a good and well-shaped head. Trees of a moderate size, chosen with this care, and well managed, will have good heads the third year; whereas those with one bud, and especially if otherwise faulty, will be four, five, or more years before they get a good head, and then not round and well-shaped neither.

When the trees are thus chosen, they require only to be cleaned and trimmed, and then planted in tubs of the mould just directed to be prepared for them; and then put

put into a condition of growth by moderate warmth, and careful waterings.

As soon as they are purchased, prepare a bed of tanners bark to receive them. It should be four feet deep, because the pots must be larger for these trees than for the generality of common plants. Fill some tubs with soft water, and let them stand full exposed to the sun for two days; then sprinkle in a table spoonful of wood-ashes over the surface of the water in each tub; and an hour after put in the plants. They must be so far plunged into the water, that only the head and half the stem remain above.

In this water let them stand two days and nights, then take them out. Look over the roots, and trim all their ends; also cut out any dead or decaying parts from among them, for these are not only useless in themselves, but they will spread infection and decay among the rest. In the same manner trim the head, cutting out all dead wood, and cutting off the rest to three inches in length. Then with a sponge wetted in the water wherein they have all this time stood, clean and wash the stems, wipe them dry with a piece of flannel, and immediately plant them.

The earth that is most fit we have described already, and a sufficient quantity of that

that must be laid in readiness near the place. The pots must be carefully chosen as to size: they must be big enough to hold the roots free, and without bending or injuring them, but no bigger; and if there be a straggling root that runs out a great way from the rest, it is best to trim it to the length of the others for this purpose; for if the pots be too large, the trees will not grow freely.

Plant the trees upright one in each pot, settle the earth carefully about the roots, give them a moderate watering, and immediately set the pots in the bark bed up to the rim. Twist a loose hay-band round the stem of each tree, to keep off sun and accidents till the juices move; and the day after they are in, give them one watering more at the root.

After this they must from time to time be watered over the whole head and stem, as well as the root; and if the sun shine fierce upon them at noon, they must be shaded with matts. This course will soon set them to growing in earnest, and they will break into very stout shoots. When these have got some considerable strength, they must be stopped at their ends, to give rise to new shoots from them. The best way is to stop them at three inches from the place when they rise, and they will then furnish

furnish new shoots with strength, and a good bed will be formed in a very little time. The third year at the utmost will shew the trees in great beauty.

When the shoots are made, and have been stopped in this manner, the trees must be allowed a great deal of air; and as it will naturally be about the middle of summer that they get into this state, they must be hardened by degrees, till they can be taken into the open air; and there they must be kept till there is danger of the autumn cold. They will now be in a condition of great health and vigour; and having stood in a sheltered place, they must about the twentieth of September be brought into the green-house. They must not be shut up in it, but allowed a great deal of free air, placing them near the windows, and opening these as often as may be done with safety; and keeping every way as free an air about the trees as may be.

As the season approaches for having the other green-house plants, they must be brought in, and the orange-trees removed from time to time into warmer parts of the house. Here they are to be kept all winter, and till May the following year; at which time they are to be taken out again into the air, and to remain till September

tember again. Every spring and autumn the earth upon the surface is to be pared off, and fresh put in its place; and from time to time they are to be watered as occasion requires. As they grow larger, they must be removed into larger pots; and finally into tubs of the same mould, always keeping the whole ball of earth that comes out of the smaller pot, to take with them into the larger, only paring away the surface, and cut it down the sides a little when it is in the new pot or tub, and filling it up with mould.

This is the management of the orange-tree, which is the most universal of those preserved in the green-house; we shall thence proceed to the general rule to be observed in managing the others. Few of these require so much trouble as the orange-tree; and the whole of them may be managed successfully in this manner.

C H A P. XXIII.

The general Management of a Green-House and its Plants.

IN a green-house constructed according to the preceding directions, a great deal will depend upon the proper quantity
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and disposition of the plants. There is no error so great as that of striving to get in too large a number: one hundred handsome and thriving plants afford more pleasure to the eye, and much more satisfaction to the owner's mind, than two which crowd and hide and starve one another. It is a natural error at first setting out to be desirous of getting too many things together; and it is a natural consequence of a love to the art, to continually encrease the objects. This must be attended to, and a choice rather than a large collection must be the thing aimed at from the beginning: as the plants are encreased, if at any time a finer offers than that already in the collection, certainly the new one should be received; but then the old one of the same kind should be removed; and upon this plan every one who has a green-house will find, that, after a few years, he must either enlarge the building, or discard a great many of the old plants.

The refuse of a green-house, for so all those plants may be called, which are put out to make room for the better, may be planted in very warm and well sheltered parts of the garden; where some of them will stand many years, and those which perish sooner will yet make a very good appearance for the time they do last. But
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this great rule must be always in mind, whatever use is made of the supernumeraries, never to over-fill the house.

Four foot must be left before the windows for a clear walk to examine and view, and occasionally dress, that part of the plants which stand forwardest. At this distance from the front is to be set the first row of the plants: these must be the smallest and lowest kinds of the whole collection; and they must stand upon the ground, not on tressels or boards.

This row should be set so open or distant pot from pot, that between every two, behind there may come in a somewhat larger plant, the pot of which may project a little between them. This will give a double instead of a single row; and beside allowing for so many plants in this moderate compass, will break in upon the disagreeable stiffness of a strait line. Behind this second row should be placed the lowest pair of tressels, and upon a strait and strong line of board laid upon these, must be placed the plants of the third row. These should be little higher than those of the second, for the rise by the tressels will carry their heads above those of the plants in the second row, and that is all that is required.

Behind

Behind this third row are to be placed more tressels higher than the first; and so on, one set behind another, each rising higher than the last, till within five foot of the back wall.

This is to be left a clear space for the sake of a free air, covering behind as well as before the plants, and for the convenience of tending and watering them.

In the several stages raised by these tressels, the rest of the plants are to be placed according to their height, in such manner that the head of one hiding the stem of another, the whole that is seen may be a fine slope of flowers and verdure.

Neither the tressels nor the rows upon the ground must reach to either end, but a free space of four foot must be left for walking round and watering the plants; and the whole quantity should be so disposed, that the eye may see every where thro' their heads, and between, and every way among them. This is not only advantageous in point of beauty, but vastly so on the more important account of their growth. For where the eye cannot pierce, the air cannot have free passage; and wherever this is the case, the leaves will lose their colour, the young shoots fade, and mouldiness will take possession of the
worst,

worst, and soon spread itself among the better.

The prevention of this accident depends in the first place upon setting the plants at a due distance; and next on the admitting from time to time free air into the house; for where that stagnates, this always follows. Therefore, whenever a mild day gives opportunity, there must be some fresh air admitted.

Cleanliness is another great article to prevent this mischief. When a leaf decays, it should be immediately pulled off; and when any fall that should have been taken off sooner, they must be immediately carried away, for the vapour of decaying parts of plants is contagious; and will always affect the weakest parts of those which are nearest to them.

When the plan of a green-house is a little more extended than to the plain and moderately sized room before directed, it should be by the addition of a wing on each side; and these projecting with a small angle inwards, will have the advantage of sun enough: they will defend the main building, and may receive particular plants. The cereus kinds, and other succulent ones, should not be left among the oranges, myrtles, and the rest, where that can be avoided; and therefore one of these two wings may

be appropriated to them. The other may receive also a particular assortment of plants, which are somewhat tenderer than those properly belonging to the green-house, and yet not so very delicate as those which require the stove: there may be a flue properly laid under the floor of this wing, and one against the wall; where a very small expence of fire, as the building will be small, will preserve the plants during the worst time of winter: and indeed, when we consider the great variety of climates from which we receive our plants, it will appear very natural to allow them a greater diversity in the degree of heat than we usually do. It will appear to reason that there ought to be many gradations of heat between the cold green-house, and the absolute stove; and experience shews also the truth and utility of it.

Whether these two wings be added, or the whole collection of plants are kept in one green-house, the method of preserving them thro' winter is the same; only that the more are kept together, the greater attention must be shewn to them, because the number and variety expose them the more to danger.

The intent of the building is to keep plants from the cold of the external air; and therefore every method must be used

to compleat this purpose as occasions offer ; but at the same time, whenever the mildness of a winter day shall render the air harmless, as much of it must be admitted as possible, for on this will depend the health and vigour of the plants, as certainly as on the other, does their absolute preservation.

The soonest that any plant need be taken into the green-house, is the twentieth of September or thereabouts ; and then only the tenderest kinds : - these should be brought in at full noon of every dry day ; and when there is not the least dew or damp upon their leaves ; they should be set in the front, close to the windows, and thus to remain till the other hardier kinds are brought in ; and then put into their places.

When the plants are to be brought in, first look carefully over them, and pick off any decayed parts or fading leaves ; and as soon as they are in, pare away half an inch of the surface of the mould wherein they grew, and lay on in the place of it an inch and half of fresh of the same kind.

Ten days after the first plants are in, bring in a second parcel in the same manner ; and from time to time the rest, keeping out the myrtles, and such others as will bear the weather longer till the frosts begin to threaten.

When all are to come in, clean and refresh them as the first, and place them on the ground, and on the stands as has been directed; and then keep all the windows shut from four in the afternoon, till eleven in the morning: but between those hours, while the weather is any thing moderate, let in as much air as can be done with safety.

Toward the end of October, when the cold grows sharper, and all the plants are in, the shutters must be closed every evening, and not opened again till the sun has been two hours up the following morning; less of the external air can now be admitted, but still in the middle of mild days some should be let in, for the free growth and fresh look of the plants will depend upon this greatly.

When the cold encreases in the depth of winter, mats must be hung on the outside of the glasses, as well as the shutters closed within, and only a little opening allowed for the light in the middle of the day. If the fading aspect of the tenderest of the plants shews this is not sufficient, there must be a slight fire lighted in the flue, and this but moderate. The good appearance of the plants will instantly come on upon this, and it must be continued just so long as the extreme cold lasts,
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and no longer, encreasing it a little when the frost is more than ordinarily severe, abating it when less, and by degrees leaving it quite off when the weather is milder.

The most dangerous weather of all for the green-house plants, is that which is extremely cold, and at the same time foggy; there is a damp in the air at these times, which joins with the cold in destroying the plants: no care can be too great to keep this out; nor must it ever be omitted to light a small fire on such occasions; for the slightest warmth in the air at these times will rarify the thick vapour, and by that means keep it from settling upon and adhering to the plants, which would destroy them. Let no one think he can absolutely shut this vapour out; the closer the plants are kept, the better, for the time it continues, but some will always get in; and the fire in this case rarifies it just as the sun does, which disperses it very speedily. The expence of what fire may be wanted in the course of a hard winter for the green-house, is not worth naming; the trouble is scarce any thing, and the plants will be preserved not only in health by it, but many of them from absolute destruction. In milder winters, when there is no need of fire, the shutters must be constantly closed at night as before directed; and

at all times when the air is any thing mild in the middle of the day, it will be right to let down the glasses a little, to get in fresh air, especially when there is little wind, and the day is dry, for this will do more service than any thing, keeping off damps and all other disorders.

Whenever a frost that has held a few days breaks, the air is rendered damp by the thaw, and on these occasions a little fire should be lighted to prevent the mischief.

With these cautions the green-house will always be in order, the orange-trees will hold their fruit and their leaves, one or both of which are very apt to fall off in winter from mismanagement, and they will be forward, and come early to vigour and beauty in summer.

The watering of green-house plants is a very tender article; some they will require, as all plants do that are in a state of growth; but it must be given with great caution, for the air will be rendered damp by it, and that is extremely prejudicial. Therefore very little must be allowed at the time when the house is obliged to be kept shut up; and more when the weather is such as permits the windows to be opened at times to let out the damp. Throughout

Throughout the whole winter the plants must be carefully looked over once in four or five days, and all decayed leaves picked off, for they will at any time spread infection among the sound plants; but most when the house is obliged to be kept shut up the closest.

Toward the end of February take the opportunity of the middle of a mild day, to let air in larger quantities into the greenhouse; but never open the glasses except when it is warm, still, and dry: winds and damp would be destructive as much as cold, after the tender condition in which the plants have been kept during winter.

A week forward in March clear off all the surface of the mould in the pots and tubs, till the surface of the uppermost roots is seen. Then cover in with fresh mould, allowing a little more of it than there was of the old, and from this time never miss a day to water them all; clean off more carefully than ever the dead leaves or other decayed parts, allow every day more air than the last, when the weather grows warmer; but still proceed even now with care: the plants are to be hardened, that they may be capable of standing out in the air, but it must be by regular and slow degrees, from their state of close confinement. If any of the orange-trees or
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others have lost part of their heads, or seem in a state of decaying, they must now be taken care of; the head must be first trimmed with a bold but careful hand, to cut out all that is dead, and shorten even the weak branches; the plant must then be taken up, and its root trimmed in the same manner, shortening the fibres and cutting away the dead or decaying parts; and then it is to be planted in fresh mould, and set in a bark bed, treating it just as at first when purchased naked from abroad. It will thus come very soon to its full vigour again.

It is better to prevent these accidents; but this will restore the plants, if by any oversight they have happened.

During all this time the plants are hardening for the summer, if a sharp wind blows from any quarter that can at all affect the front of the green-house, shut the glasses as carefully till it is over, as if it were the depth of winter; but take care to open them gradually again, as soon as it is past. As the season of growth is now come, clean the stems and branches of all the plants, and even the leaves where necessary, with a sponge in warm water, drying them with a flannel.

As soon as April is well set in, the hardiest of the plants may be removed out
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of the green-house, and set in some very warm spot under a south wall or pales. This will give more room, and fresh air to the rest, and both will fare the better for it; for all green-house plants should be got into the air as soon as they can, with safety.

This is the season also for trimming and heading down those shrubs which are of a hardier nature than oranges, as the myrtles and the like; they may thus be brought to a good shape, and if they are unhealthy, they must be trimmed down the closer, and then managed as directed for the orange-trees. At the end of April take out another parcel of the green-house plants, which, tho' less hardy than the first, will bear exposure sooner than the orange-trees: the cistus and oleanders, and the like, are of this kind; remove them into the air in the middle of a warm day, and set them under the perfect shelter of a south wall; full before the sun, and perfectly defended from the cold winds.

At the same time shift those orange-trees and other kinds which have grown too big for their pots, into larger, as directed in their general culture; observing to water them carefully from that time till they are perfectly well rooted again.

As soon as May is come in, the windows of the green-house must be thrown open,
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in all tolerably fine weather; and toward the twentieth of that month all the plants are to be taken out entirely, setting them to enjoy the free air, and adorn the garden in some place perfectly open to the sun, and as perfectly sheltered from all cold winds. Thus we have brought the management round from the taking them in, to the placing them out; and may conclude our article of green-house management, only observing that the several kinds be well distinguished as to their degrees of hardiness. These degrees we have established under three heads; the hardiest, those of a middle kind, and the tenderest of all. These several sorts are to be set out, and taken in, in succession, according to this their degree of hardiness. The hardiest of all are the myrtles, cistus's, tree worm-wood, and the like: these constitute the first class of green-house plants, and may indeed be kept alive many years thro' winter in the open air; therefore these are not to be taken in till the beginning of November, and may be set out again in the beginning of April.

The middle kinds are the single oleander, and the like, which should be taken in about the third week in October, and set out again the third week in April.

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The tenderest class are the orange, Spanish jessamines, geraniums, and the like: they should be taken in toward the end of September, and not set out again till the middle of May. And it must always be observed when they are first taken out, to place them in a very warm spot, and somewhat shaded; for if the full sun comes upon them while they are fresh from the house, it turns them brown.

C H A P. XXIV.

The management of Stove Plants illustrated by the Sensitive Plant.

THE construction of the stove we have given in a preceding chapter, and shall now shew its management, in one tender plant, and in the great fruit the pine-apple; for these being understood, all else may be referred to one or other of them. We chuse the sensitive as one of the tenderest; and one which demands preference, also an account of that sensibility by which it approaches as it were to the animal nature.

There are many species of the sensitive plant, all enjoying the same singular quality, of drooping and closing their leaves on the least touch.

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They are all natives of warm climates, and are all to be raised in the stove, in the manner as other kinds from the same places.

Obtain some good fresh seeds ripened in the native climate of the plant, and sow them in this manner. Fill eight or ten small pots with very fine compost, and set them up to the rim in the bark-bed, in the stove: give them a little water when first set in, to moisten the mould; and thus leave them two days and nights, to get a due warmth throughout. Then lay upon the surface of the mould in each pot four seeds of the sensitive plant, cover them a quarter of an inch deep with fresh mould, which has lain in a corner of the stove two days; and thus leave them to shoot. As soon as the young plants appear, which will be in about sixteen days, observe which seems the strongest. Let them stand three or four days to be sure; the plant fixed upon as the best is really so, and then pull up carefully all the others; leaving one fine plant in each pot, and no more.

From this time water the plants now and then; but this must be done gently, and with the greatest care: thus they will take their chance with the rest of the stove-plants, and grow as they do. When they have got to some size, it will be proper to remove them into larger pots. For this purpose

purpose bring in some fresh mould, and as many somewhat larger pots as there are plants. Let both stand three days to be of the temper of the stove, then put a little of the mould into the bottom of each fresh pot. Break the pots the plants are in at present softly and carefully; and when the pieces are all fallen away, and the lump of mould is entire with the plant, set it in the new pot: fill the space round it with more of the mould, and raise it half an inch above the surface of the ball of earth. Set the plants when thus managed immediately in the bark-bed up to the rims of the pots, and give them a gentle watering. This is to be repeated occasionally, in the same manner as to the other plants; and when these grow larger, and require to be shifted again into bigger pots, it should be done just in the same manner. This is all, and thus easy is the management of stove-plants, keeping at all times a due heat in the air, and clearing away every kind of dirt. The management of the heat will be given at large under the next article.

C H A P. XXV.

Of the Culture of the Pine-Apple.

TH E R E are several varieties of the pine-apple, in relation to the size and

and colour of the fruit, as in melons and other kinds raised by careful culture; but the principal that are to be regarded are two, the common, and the sugar loaf pineapple. The first of these is smaller and oval, and has a white flesh; the other is larger at the bottom, smaller to the top, and has yellowish flesh; the first mentioned kind was that first raised in Holland and in England; but the other is larger and better flavoured, and every way perferable; therefore this should be cultivated. Curiosity may add the king-pine; which has smooth green-leaves, and some others, but the sugar-loaf pine is the best for the table.

It might be possible to raise this plant from seed sent from Africa, or perhaps even to ripen it to a due perfection here; but it is not necessary to be at that trouble, for every fruit produces upon its summit the rudiment of a new plant; and the stalks besides send out suckers from their sides, and under the fruit, which all grow readily; so that there is always the means at hand, not of a continuation only, but encrease. Indeed there is something more in the power of nature, and consequently within the reach of art.

C H A P. XXVI.

*Of the Proliferous Pine Apple. **

AMONG a number of pine-apples raised two years since in the island of Antigua, there appeared one of an extraordinary size and form; covered, as well as crowned, by its new offspring. This was brought into England, preserved in a kind of pickle, and presented to her Royal Highness the Princess Dowager of Wales, who is pleased to honour these studies with her most gracious protection and regard. The root, the height of stem, and common circumstances of growth, were the same in this as in other plants of its kind; but the fruit was, in the highest degree, wonderful in its construction.

In the common pine-apple the top of the fruit is terminated by a crown of leaves, arising from a small fleshy base; and this is properly a young shoot, which needs only to be separated, and planted to grow. The surface of the fruit, from the base of this crown to the stalk, is every where covered with tubercles, within which are placed the flowers and seeds of

* Dr. HILL's Vegetable System, Vol. I. p. 122.

of the plant. In this most singular subject many of the tubercles of the fruit grew out into so many little crowns, each formed perfectly as the natural crown at the top of a common pine-apple; and all as fit for growth. The tubercles on one side of the fruit, for a small space, retained their natural form, while the whole circumference beside was covered with these lesser crowns so close, that they crowded one another. There were not less than seventy of those new productions on the single fruit; and the whole appears to have enjoyed a state of vigour and full growth at the time when it was cut, which seems to have been about ten days before its natural ripeness.

Since we know from this strange effort of nature, that the pine-apple fruit is capable of proliferation in an extreme degree, it may not be impossible to turn the subject to account: for we know proliferation in flowers may be brought on by a peculiar management; and probably the same holds true of this: if it should prove so, the increase would be many times greater than any other way. It may not be foreign to the purpose, to hint so much, as to the possible utility of the proliferation of pine-apples: but our immediate business here is to examine in what

what manner nature produced this most extraordinary offspring : for that way only art can pursue the advantage.

I have been permitted to cut the proli-ferous fruit asunder, to assist in this re-search, and by comparison of its construc-tion with that of the natural and common pine-apple, I think the course by which these new shoots were protruded may be found. The first step toward this is, to know truly the structure of the pine-ap-ple in its usual state ; for in this there is something very different from the forma-tion of other plants : that we may trace this from the first stage to the last, under our own sight, it will be proper to select a plant raised from a crown of a common pine-apple. Its growth is this.

The crown of leaves being twisted off from a ripe pine-apple, there comes out with them that fleshy base before named, to which they are connected, and from which they grow. When it has been sometime planted, fibres are shot out from this fleshy substance at the base, for seek-ing nourishment ; and these, by degrees, grow to be so many roots, of the thickness of a large pack-thread, and of an extreme length. From their sides also grow nume-rous branched fibres. As we plant the crowns in pots, these roots, when they

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have

have reached the bottom, turn up again, spread themselves through the body of mould, and run up to the surface.

These fibres rise in two, or three, or more circles, round about the fleshy base of the crown; none from its bottom: that becomes callous, and is wholly useless to the growth.

In this base, and in the fibres, equally, we may trace, by a careful examination, six of the seven proper constituent parts of plants. The pith alone is wanting: this is wanting entirely; and we have here a proof of the doctrine lately established, though it be contrary to the received opinions, namely, that the pith is not an essential part of plants; since here is one without it.

The disposition of the parts in the pineapple is not exactly as in other plants, but is peculiarly adapted to the nature of the growth. Whether we examine a fibre of the root, the original base of the crown, or the rising stalk, which is a continuation, or farther growth of that base, we see the same construction: nay, we may trace it through the fruit itself.

The best part for examination is the stalk. A thin slice of this laid before a good microscope, shews distinctly, 1. a thin colourless outer bark; 2. a thick green

green inner rind; 3. a thin coat of pure blea; this is of the colour and aspect of a fine rich jelly, a little tinged from the inner rind. The flesh of the plant follows, but this is very singularly disposed: it is not connected into a body, nor does it make a regular circle in the stalk. We know the flesh in all plants is vascular; and in this species the vessels are distinct. They are as thick as a small twine; yellowish in colour, and plainly hollow; and these with a large proportion of the blea, make up the body of the stalk. The two more delicate parts remaining are to be seen only with great magnifiers, for they are both minute. Upon the coats of those vessels which are nearest the outer surface of the stalk, runs a separated vascular series; and on the inner surfaces of those near the center, and those only run the conic clusters. The first are pale brown, the second green; so their colour serves to distinguish them; the absolute flesh-vessels being yellowish.

It may appear singular, that the blea of the stalk in this plant takes the place of pith, for so it does, mixing itself every where between and among the fibres, and occupying even the center. But neither this disposition of that part, nor its quality, will surprize us, when, by tracing the

course farther, we find this blea is destined to make the pulp of the fruit.

If we split the new-planted crown of a pine-apple soon after it has begun to grow, we shall find the fleshy lump within, beginning to lengthen into a stalk; and very soon the rudiment of another fruit is seen upon its top, and on the head of this, its own small crown. Thus is the propagation of this plant a most clear instance of what has been before asserted, that all vegetable increase, however the term generation may have been applied to it in some instances, is nothing more than a continued growth.

If we next split down a half-grown pine-apple with its stalk, we see its construction yet more distinctly; and may trace, with ease, the origination of the fruit.

In this section we see clearly, that the pine-apple is not so properly a fruit fixed upon a stalk, as a stalk swelling into a fruit. To find how this is done, our attention must be directed to the part where the stalk ends and the fruit begins. Here we see plainly enough the continuations of the several parts. The outer rind thickens, and gives origin to those small films, or imperfect leaves which rise under the tubercles; the inner rind forms the coat of the tubercles, under which the blea

blea swells and expands into the body of the fruit. A great quantity of it is sent up to this part, where it expands and stretches out the stalk into a kind of oval form, and ripening, becomes the delicate pulp of the fruit. All this while the flesh-vessels, with their concomitant lesser vascular systems, run up strait through the center of the fruit, not separating to any greater distance, but forming the same kind of loose column they did in the stalk itself.

There is no difference between the flesh vessels of the fruit and those of the stalk, except that in the fruit they are smaller and more numerous, having divided, and sent off a few very delicate portions sideways and obliquely upwards, which are to give origin to the filaments within the flowers lodged in the tubercles.

This is the structure of the fruit of the pine-apple, whose small flowers are formed within those tubercles, in all respects, as in other plants. But in the mean time that essential substance the flesh of the plant, which has continued its strait and upright course through the fruit, when it has reached the summit, forms a new solid substance, which is the rudiment of a new plant; and from this rises the crown of leaves. This terminates the growth; and this being ready to take root, and vegetate

again, nature, in a manner, trifles with the flowers, and is little solicitous about seeds.

The small mass of flesh formed where the flesh-vessels terminate at the head of the fruit, is the most essential part of the plant, the seat of life of the succeeding offspring, and the point from which all is to grow. We are interested therefore to understand this distinctly. It is thus formed. When the flesh-vessels have arrived at this, their extreme growth, they prepare to return upon themselves: each divided into several smaller; but at the summit, they are again divided into almost innumerable and extremely minute threads. The coats of these, which are very tender, suffer a part of their juice to ouze out: this part is white, like cream, and it soon thickens. The fine flesh-vessels having returned in arches at the summit of the part, come in an elliptick form, as in the globules of farina of other plants, to the base of that part, and there, while some run down, the greater part inosculate with one another. The juice they have extravasated, forms a thick fleshy matter between them, and a great deal of the same white juice being extravasated at the part, where the flesh-vessels begin to divide thus minutely, this spreads itself round the
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fleshy lump already formed, making it a thick white coat: and thus the base of the pine-apple crown is finished. The growth of leaves is natural when nourishment is continued; for this base being composed of the flesh of the plant, can produce all the other parts; and the two rinds, which its extravasated juices form, make those leaves.

This is the structure of the pine-apple in its natural state; and from what we have seen of the vegetable nature, it is plain this crown, when committed to the ground, must grow. This fleshy lump has the same construction with a globule of farina, only it is more largely formed. The elliptic rings are larger by many degrees, and there are vast numbers of them. The white juce which thickens between the flesh-vessels, and round them, is the rich blea of a new plant; and the two coats are given it by the hardening of its own juices in the air; as they are given to all other plants. Therefore this fleshy lump is the natural original of a new plant, which has shot its crown of leaves while it remains upon the parent stalk, as the original elliptic ring of the farina in other plants does its seed-leaves; and like that, when committed properly to the earth, it is ready to grow.

Wherever the flesh-vessels of this plant form, by their termination, a fleshy lump, there is the original of a new plant: the extravasated juices of those vessels form a blea, and the two rinds are given this by the air, as in all other cases.

In the natural and common state of the pine-apple, the whole body of flesh-vessels runs up to the summit of the fruit; and only a few very minute branches from them are sent off sideways toward the tubercles, for forming the filaments of the flower. But if luxuriant nourishment, or any other favouring accident, cause the flesh-vessels to be so strong in vigour that these side-branches, naturally minute, become enlarged, and are like those of the middle column, then they will terminate at the surface, not in their own peculiar manner, as filaments, but in the same way as those of the middle column: that is, there will be formed at the extremity a fleshy mass, and from this leaves will grow. It will terminate the flesh-vessels of the old plant in their natural way: that is, it will give the origination of a new one; which will obtain its crown of leaves while it remains upon the parent stock; and when removed from it, will be ready to grow. The terminations of these clusters of enlarged branches from the column of flesh-vessels, must

must be at the tubercles of the fruit; because those branches are directed only thither; consequently, it is within a tubercle only that each of these fleshy terminations must be formed.

We thus see from reason, the necessity of what appeared so strange in this great fruit: for if any cause could enlarge those branches of the flesh vessels which go to the tubercles, in the natural state of the plant, they must, instead of filaments in a flower, form new originations of plants in those tubercles; these must have their first growth upon the plant; that first growth is a crown of leaves, and, consequently, each tubercle to which such a quantity of enlarged branches went, must, instead of containing an inconsiderable flower, burst into a full crown.

A section of the proliferous fruit which gave a plain illustration of this system and very happily a part of the tubercles of this curious specimen, having retained their original and natural condition, we could see this alteration most distinctly.

In the split stalk, we can see the flesh-vessels, large and few in number, pursuing their plain course up the stalk: at the base of the fruit, they divide; and in the column, which runs up the middle of the fruit,

fruit, they were smaller, and more numerous.

Luxuriant nourishment having been afforded them at the point, this column divided; and instead of one crown, the natural termination of a pine-apple fruit, there were formed two of those fleshy bases, and these sending out leaves, as usual, there were two crowns formed in the place of one.

On one side this middle column of flesh-vessels sent out a number of clusters of small branches, as is usual, and these kept their natural course and proper size; and ran to the tubercles for which they are destined, in a right form for constituting filaments in the intended flowers of the plant: these tubercles therefore kept their natural form; and even, on the other side, there were two or three clusters, which held the same unaltered condition, and therefore terminate at natural tubercles: but for the most part on this side and through the greater part of the body of the fruit, we saw those clusters of branches from the central column of flesh-vessels, enlarged to a degree in which they were no longer clusters of ramifications, but so many columns of full vessels, like in dimensions, and in form, to the natural central column in the fruit. As they were like those in their nature, they must terminate

minate as they do; not in filaments, but in proper crowns. And thus the pine-apple became prolificous."

Thus we see the pine-apple can produce from every tubercle, a crown fit for growth into another plant; and we know by the construction of these that they are, as sure to grow up into perfect plants, as the absolute crowns, or usual suckers.

In the culture, the management of the crowns, buds, and suckers, is to be exactly the same; we shall therefore give that method for the crown, as the latest improvements have shewn most successful.

Take off the crown from a ripe pine-apple by a gentle twist. Wipe it dry, pull off the lowermost leaves, so as to make a plain and naked part for planting; and then lay it in a dry warm place to heal. Let it lie till the bottom and the places where the leaves were taken off are all dry and skinned over: this will require about four days in summer, but a week or ten days will be necessary for it in winter.

When the crown is thus dry and healed, plant it in a sound pot of the common mould or compost made for the kitchen-garden. First cover the hole in the bottom of the pot with an oyster shell, that it may not choke up with any of the mould; then plant the crown up to the part where the
leaves

leaves rise; and fill in the mould very carefully, and press it very well about it. Set it up to the rim in the bark-bed, and for eight days give the plant no water.

After this water it carefully a little at a time, and not oftener than once in a week, till it has shewn good signs of a strong growth; then water it as other plants, sprinkling the leaves, as well as the earth about the root.

In this manner the plants are to stand the whole remainder of the summer, and all the succeeding winter. The following spring they will require to be shifted into new pots. The first week in April is the best time of all for this; and it is to be done in the following manner. Lay a quantity of fresh mould in the stove to warm, then chuse out as many sound pots as there are plants, and let them also stand to warm in a corner of the stove. When these have been in the stove three days, lay an oyster-shell carefully over the hole of each pot, and put in half an inch depth of the mould into each of these pots. Then break the others carefully, and get out the entire ball of earth with the plants; set them upright in the new pots, then gently trim off the ragged ends of fibres from the outside of the ball; and immediately fill up the space between that and the pot with

with mould, putting it very carefully in. Let this fill the whole space, and rise an inch above the old ball. Then plunge the pot immediately in the bark-bed again; and give a gentle watering, over the leaves as well as on the mould.

From this time let them be treated as the rest all summer: at the latter end of August select such as shew by their size and vigour that they will fruit the next spring; and once more shift these into somewhat larger pots. Let the others remain in the same they are in at present till more grown.

Those larger plants that shew they will fruit next spring, must be shifted in the same manner as they were in April; and the proper sized pots for them now are what we call two-penny ones.

Let them be first taken out of the tan-bed, and have ready some new tan, that has lain two or three days to drain. Stir up the whole quantity of tan in the pit with a fork, and add the fresh. This may be done by one person, while the plants are managed by two others, and thus they will be ready to plunge in by that time the bed is made up again. They must be watered as before; and they will now grow very quick and vigorously from the warmth the bed gets by this
fresh

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fresh stirring. This will keep up a heat sufficient for them, without the help of a fire in the stove, till toward the end of November; then, or sooner, if the weather be very severe sooner, the fire must be made, and they must be kept secure from any check by cold.

In some time after this the fruit will shew itself; and from that time to the ripening, there must be the greatest care taken to keep the plants in a free and vigorous state of growth; for on that depends the size and flavour of the fruit.

The fruit of the forwardest plants will naturally be ripe about the middle of June; and from this time till October there will be a succession of good fruits, which will ripen one after another according to the growth and strength of the plants. Those plants which were backwarder, and not ready for shifting when the first were, must be watered till they are; and then treated exactly in the same manner, and their fruit will follow the others: the crowns of those which are cut, may be planted as they come to hand; and thus there will be a regular and lasting supply for the table.

A particular care should be taken to distinguish those plants which have born the finest fruits, for 'tis ealy to raise suckers

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from any of them; and these should be preferred as the fruit will follow their kind.

The best method is this : As soon as a fruit is cut, which is large, well-shaped, and well-scented, trim off the leaves of the plant, and set the pot up to the rim in a good hot-bed, water it constantly once in four and twenty hours ; but do it very carefully, a little at each time ; let in some air in the middle of the day, but not too freely, and by this management there will presently be a number of suckers, which must be taken off as soon as they have sufficient growth and strength, and treated exactly as the crowns and suckers in the former instances. By these means when a pinery is once established, there will come naturally and easily a succession of fruit for the table ; and the stock will from year to year improve, not only in quantity but quality ; for if the succession be carefully provided from the crowns and suckers only of the most excellent fruits, these will follow their kind, and the whole succeeding quantities will be such only.

The heat of the stove being kept up duly, and the plants watered carefully, there will be no danger of their growth to perfection : the only accident to which they are liable is the bug ; and this rarely,

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ly attacks them, unless when there has been some mismanagement, and they are sickly. If this insect be neglected upon them, the number will encrease to their destruction, but the remedy is easy: put two pound of tobacco stalks, and one pound of wood-foot, into a tub, and pour upon them three gallons of boiling water; let this stand till cold, and then wash the plants with a sponge dipped in it. The insects will be destroyed, and the plants assisted in their growth by this treatment.





and well (good) and to keep the well-trees

 RUIT-trees may be considered under three heads, the standards or orchard trees, the espaliers, and the wall-fruit. To these may be added dwarfs, which are of the nature of the espaliers, being confined to a certain proportion of growth, and kept in a very regular order. But in good reason these and the espalier trees ought to be banished the garden entirely. We have shewn that a kitchen-garden does best without them; and we may affirm with great justice, that as all the kitchen-products will succeed the better without those borders of fruit-trees, so the fruit-trees will also succeed better where they have the

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ground to themselves, provided it be well dug, than where it is exhausted by those treacherous crops.

Those who chuse the common method, may cultivate their trees as we shall direct, for the plain standards, only bending them down as dwarfs, or tying them to a piece of fine work for espaliers, for that is all the difference: but the true method is to consider no other division, but of standard and wall trees; and to keep the wall-trees to the kitchen-garden, and plant the standards in an orchard. Wherever there is a good wall, properly situated beside those of the kitchen-garden, it should certainly be covered with wall-fruit: and as to the standards, if a sufficient scope of ground be allowed them in a well chosen place, they will produce finer fruit in a more free growth than when kept in the pitiful form of dwarfs or hedges.

The great matter in obtaining good fruit, is to plant the trees where there is a good soil and sufficient sun: and in regard to the hardier kinds or standards, to allow them room enough for the air to have free passage between tree and tree, and between one part and another of the same tree. The first must be provided for at the time of planting, the other in the pruning. The standard or orchard-trees being the
hardier

hardier, we shall begin with them; and the lesser care that is needful about these, will lead us easily to the nicer and more delicate articles of the culture of wall-fruit.

CHAP. I.

Of the Disposition of an Orchard.

AS the orchard will be near the garden, the soil will naturally be of the same kind: if that be good, this will not be deficient. The situation must be carefully chosen: it must have the full sun; nothing must obstruct it to the south south-east, and south-west. The north must be sheltered, and the north-east: if this situation be chosen with care, there will be no danger of the success.

Such an orchard will properly raise apples, pears, plumbs, cherries, quinces, and all the usual hardy fruit, the fine plumbs and cherries being reserved for the walls, and treated with little less care than the peaches and nectarines.

The number of trees must be carefully proportioned to the extent of the ground: they must not stand nearer than sixty-five feet asunder, and should be planted in rows interchangeable, one tree against the space

between two in the adjoining rows, not over against one another.

The ground should be very well prepared to receive the trees; and as there will be free room for the plow, which affords a cheap and easy tillage, this should be also repeated occasionally as they are growing. We shall recommend more ground than is usually allowed for orchards, and somewhat more labour, but the fruit will very well repay. It is a custom to let orchards be covered with a turff, but this should never be allowed, much less any deep rooting weeds. On the other hand, some who allow good space and tillage, sow the land with corn: but this is against our principles of gardening; the very first of which is, that every plant or tree should have the full advantage of the ground where it grows. 'Tis true, the corn will not be the worse for the trees in such a plantation, but the trees will be the worse for the corn: therefore let one thing be considered in one ground, and no more.

The ground being chosen, about the middle of September it must be plowed up very deeply and strongly. Let it lie till the last week in October, then harrow it level, and bring in the trees; plant them carefully and not too deep, at the distances here directed; and lay a quantity of turff with

with the wrong side upwards, round the stem of each tree: then drive in a stout stake close to the tree, and tie it up to this with a hay-band. Thus the plantation is securely made, and may be left to nature.

If the following spring be dry, there must be the trouble of once thoroughly watering the trees; and if the drought still should continue, which indeed is very uncommon, it must be repeated. It will never be required again: the trouble is something, but a cart will do it in less time than might be thought.

After this, once in the year at least, the whole ground must be plowed to prevent the growth of weeds, and to mellow and enrich it for the roots of the trees; which will very soon spread, so as that their fibres will meet one another, even from these great distances; and the land will have a kind of fallow, wherever they do not come, which will excellently prepare for them when they do.

All the future care of the trees consists in preserving and keeping them clean. The first appearances of moss upon the trunks or branches, must be carefully cleared away, otherwise it will encrease; and every autumn the heads must be reduced to order by the knife or bill.

No more branches must be suffered to stand than can grow perfectly clear of one another; and if two cross each other, one must for that reason be cut off, for they will else wound and spoil one another.

Where any branch is cut away, the wound must be left with a perfectly even surface, and slanting downwards.

If the shoots from the main branches, that are allowed to stand, are found to crowd, or cross, or interfere with one another, these must be cut away in the same manner: by this means each tree will have a large open head, with a great deal of bearing wood, and a great deal of nourishment from the extent of ground to supply it. The blossoms will come thick, and the fruit set well; and in the way of its growth there will be such free course for the air, and full access for the sun, that every kind will have its perfect colour, scent and flavour.

This is the compleat management of standard fruit-trees: and the small shrubs, which produce the humbler kinds, are to be kept in order upon the same general plan. The gooseberry and currant bushes, will naturally have the ground dug about them; for their usual place is in the borders of some part of the kitchen-ground; and all the care they require is in autum,

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to trim them in this manner, cutting out
all dead wood, thinning the branches where
they rise too close, and taking off the
suckers.

C H A P. II.

Of the Management of Wall-Fruit.

THE tenderer kinds, and the more
valuable fruits, which are raised
against the walls, require a management
much more exact and regular than the
hardy standards: but in these it is so far
the same for the several kinds, that when
rules are given at large for one, a very
short lesson will answer for the others.
We shall select the apricot, as the first
instance, because the directions will be
less confused, than where there are more
species or varieties under one general name.

C H A P. III.

The Management of the Apricot-Tree.

WE have several kinds of apricots,
but they are no more than varieties
of the fruit of the same species of tree:
however, as their flavour differs, and they

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ripen at very distinct seasons, they have a right to be considered by the gardener as thoroughly distinct kinds. A good garden should have them all, because by that means, and that only, there will be a succession of fruit. The masculine, which is the first apricot for ripening, will be in its perfection with good care early in May, and the Brussell's apricot will be in its perfection in September; so that four or five months there may be a supply of this excellent fruit, for there are no less five other kinds to come in between these two, which are the extremes of earliness and lateness: the orange apricot follows the masculine, and ripens in the beginning of June; the Algier apricot comes in about the twenty-sixth of the same month; the Roman is ripe toward the middle of July, and the true Turkey at the end of that month; the Breda apricot is in its glory in August.

All these kinds are to be treated in the same manner in all respects, except that the times of pruning must be a little latter or a little earlier, in the proportion to their seasons of ripening. The Brussell's and Breda are very fit for standards, the others require walls; and even these, which are the hardiest, produce much larger fruit, when they have that advantage. When the apricot-
tree

tree is raised as a standard, it should never be suffered to grow too tall ; a yard high in the stem is sufficient, then the head is to be managed easily. The fruit will be better, and winds will have less effect upon the trees.

The apricot should be raised by budding on the plumb-stock ; and the walls against which these trees stand should not be full south. Those walls which enjoy that aspect, will be wanted for other fruits, and the over heat would make the apricot dry and insipid. A west or south-west wall is excellent for apricots ; and an east or south-east is nearly as well ; only great care must be taken to defend these last from the north.

The borders for these trees should be equal to the height of the wall, against which they stand, which may be eleven foot. It is common to make borders of a yard and half wide ; and they think they allow a great deal, who give two yards ; but the fruit will be incomparably better, when they are of the full breadth here directed.

We have already directed that nothing grow upon these borders ; thus the fruit will have the full benefit of this quantity of ground. The good mould must be three quarters of a yard deep in these borders ; and therefore what it naturally wants of this, must

must be made up from the bed of compost.

The trees should be planted about the third week in October, and they should be one year budded before they are planted in their places.

When they are brought in to be planted, first cut off the strait down right roots, to about four inches; then cut away every part that is at all decayed, and lastly trim the ends of the fibres, taking off as much of them as appears dried.

Let the head quite alone, except there be any very awkward foreright-shoot upon it, which cannot be got to the wall, and such a one must be cut away at once; or more, if there be such. The trees should be planted at six yards distance from one another. Each tree should be planted at four inches clear distance from the wall; and the head be bent to the wall, and the branches nailed to it, which will prevent any damage from the wind. Then the surface of the earth, about the bottom of the stem, must be covered with some old rotted dung from a cucumber-bed, and thus the tree left for the winter.

At the latter end of February following prune these trees. Cut off the main shoot or shoots, so as to leave only five buds above the place where the tree was budded; in doing this use a very sharp instrument,
keep

keep the tree firm in its place while it is doing, and cut off the shoots slanting, with the wound toward the wall. Then fasten them carefully to the wall again, and lay some turff about their roots, with the green part downwards. Water them thro' this, and all over their heads, two or three times during the course of the spring, and from this time mark and manage the shoots. If any rise foreright from the tree, rub them off in the bud; but for all the others lay them horizontally upon the surface of the wall, and nail them from time to time as they encrease in length.

In the beginning of October unnail these branches, and prune them, leave about seven inches long, or, if any be very strong, three inches longer. Then nail them up again, and leave them as before.

The next summer proceed in the same manner; rubbing away all foreright shoots, and nailing the others as horizontally as possible upon the wall.

If there be a vacant place any where upon that part of the wall where the tree is covering, rub off the end of one of the shoots that is nearest: this will afford the supply that is wanted. But all the other shoots must be suffered to take their full and free growth during summer.

A fortnight after Michaelmas prune the trees again just as before.

The third year do the same, and take this season a great deal of care, not to hurt the spurs, which rise from the wood of the preceeding year; for these will yield fruit the following summer in the very same manner as the last year's proper wood.

The following autumn the whole tree is to be looked over with the greatest care. We are now to consider the means of forming the best and finest fruit in as large quantity as the tree can thoroughly feed and ripen it: to this purpose we must obtain as much bearing wood as we can, and take care that it is not starved. The first is to be provided by shortening the the ends of all the branches in this autumn pruning; and the latter by cutting all bad and luxuriant shoots, which would starve the rest. Thus will they be brought to bear in perfection, and every year the same management should be continued, which will keep them in the same good order. In spring, when the trees blossom, place a reed-hege at some little distance, if they are at all exposed to the wind in any quarter; and stick a few pieces of furze-bush here and there between the main branches and the wall. These will defend the re-

of the tree a little by projecting beyond it; and more than this should never be done; for all covering is attended with bad consequences when taken off.

When the fruit is just set, if the weather be dry, sprinkle the whole tree carefully with water that has stood in the greenhouse all night. The best way is to take out the water in a pail, and dipping a broad brush in it, such as plaisterers use, to sprinkle the whole-tree with this, from a distance so that the water may fall small and evenly upon it.

If the blossoming season be very rainy, it will be proper to place a ledge of deal board shelving from the top of the wall, to keep off the heavy descent of the drops just while the blossoms are open, and the fruit is setting; but no longer.

When the fruit is set and secure, the care is to thin it, for apricots as well as all others of the like kind are produced much thicker upon the branches than they can possibly be ripened; and it is better to have a smaller number perfectly fine, than a multitude that are indifferent.

A considerable number should be taken off at this early thinning, but many more afterwards. These are good for nothing which are taken off now; but at the second and third thinnings, which must be
done

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done as they grow larger, at the distance of a little time one from another, the fruit taken off serves for tarts and preserves. In the last thinning, which should be made when the fruit is half grown, those which are left upon the tree to ripen, should never stand two together, nor too close any way, but always clear and single; and they should no where be left nearer than three inches asunder. In this manner, the tree will be able to feed them perfectly, and they will ripen in a degree of perfection which is never seen in those that remain crowded upon the tree. One apricot, thus ripened, will be worth twenty in the common way; for where they crowd one another, none of them have their true flavour.

In the course of the summer, the trees should be often watered, and then the ground dug up at some distance from their stems; and the whole border must at all times be kept free from weeds.

C H A P. V.

Of the Peach.

THE peach is propagated as the apricot, but being somewhat tenderer there are a few particulars which must be regarded in its management. We have many kinds; and as they ripen at different seasons, a good garden should have them all, or at least one of each of the best kinds. The whole would be too great a load upon the memory, for I know more than forty by distinct names, and the nursery-men know, or pretend to know, several others. The best early peach for a gentleman's garden is the red nutmeg-peach. There is a white nutmeg that ripens somewhat earlier, but it is not comparable to the red. This kind is ripe within the month of July; and peaches need not be expected sooner. The mignon ripens early in August, and is a fine kind, for the second: the early purple peach comes in toward the twentieth of August, and is a capitally fine kind. The red magdalen ripens at the end of August, and is a very valuable kind. The noblest comes in at the very beginning of September, and is another very fine one. Within the course of the
same

same month, come in also the Bellegarde, the admirable, the old Newington, the royal, and the Persique; all very excellent kinds. The October peaches depend upon the season; but there should always be some of these late kinds in a good garden, for when they do ripen they are very valuable, as coming in when no other can be had. The Catherine, the sanguinelle, and pom-poune, are all fit for this late expectation.

There is a peculiar peach, the bourdine, which succeeds very well in a standard as the apricot; and if it be in a warm place, and not carried up too high in the stem, will bear very well: this and the standard apricot trees, require only the same management with orchard fruit-trees. The wall peaches must be treated with a great deal of care, for the quantity and excellence of their fruit will be in proportion. These kinds of peaches, like the several apricots, are all varieties from one original stock or kind: they have been raised by planting the stones of fine peaches, for these trees vary from seed like flowers: as this is easy every one should do it. The first stock may be from an honest nurseryman, but it will be worth while to raise new kinds this way, afterwards. The peaches which ripen in the beginning of August should be chosen for this purpose, and such

as have a thin skin, a yellowish juicy flesh, and a small stone, sticking to the flesh, not parting from it. A few of the these, of the very choicest, should hang on the tree till they drop off, and the stones of these should be planted in a small bed of the nursery six weeks afterwards. The young plants are to be managed with the same care as tender shrubs or plants of other kinds, and at two years growth are to be planted in the places designed for them, with the same care, and in the very same manner, as directed for the apricots.

They are to stand in their new places till they have born fruit; and after the second year of fruiting, it will be found what is their value; the bad ones may then be pulled up, and the fine ones propagated, by inoculating them on stocks in the common manner.

The best stocks for the early kinds are the almond, and for the others the muscplumb. These stocks are to be raised from the stone, and trees planted at one year old, to prevent their sending down great top roots; and after two years more growth in the nursery, they will be fit for this purpose. The method of doing this we have laid down in its proper place.

When the trees are to be brought to the places where they are to stand, they must

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be taken up with care early in autumn, the roots trimm'd, the trees carefully planted, and all the branches nailed slightly to the wall: they are to be defended during winter, by laying some turffs at their roots wrong side upwards, and to be watered in spring.

About the 20th of March these trees must be unnailed, and cut off at about five eyes above the place of budding. Then when the shoots grow, they must be laid horizontally on the wall, and carefully nailed: all this we have directed at large, in treating of the apricot. The autumn following the trees must be pruned, and the shoots left seven, eight, or nine inches long, according to the strength of the tree.

The next summer rub off all fore-right shoots, and train the others horizontally, nailing them in that direction to the wall. In autumn prune them again as before, and thus proceed to the time of bearing.

The trees being thus brought to a bearing condition, all that is required afterwards, is, by careful and judicious prunings, to keep them constantly supplied with bearing wood. This is the shoots of the last year, or year before that, for older wood than this does not bear. Therefore every autumn the shoots must be taken

taken off at their tops, so as to make them send out side-branches; and these must be laid regularly, and at equal distances over the wall; so as not to crowd one another, nor leave any part vacant. About the middle of May the trees should be carefully looked over, and all the buds which would run into fore-right shoots should be rubbed off: then the ends of the shoots should also be pinched off; and this being the growing season, the efforts of nature will be made to send out new shoots when they are most wanted: ten days after the same should be repeated, and all the new shoots must then be laid regularly to the wall. In October, when the leaves are fallen, the trees are to be regularly pruned and nailed in order to the wall; and this must be done with a due regard to the two sorts of buds. Some are thick and soft: these are the buds which will blossom the next spring: others are longer, and of a firmer texture; these are the rudiments of future branches; in pruning the shoots, it must be done just so as to have one of these firm buds at the end, for that will draw the nourishment to the end, otherwise the extremity is apt to perish. The shoots are to be pruned to the same length as in the apricot, from six to ten inches, according to the strength of the tree.

With regard to the management of the fruit, the great article is to keep the trees themselves in health, by digging up the borders once or twice in a season with a three-pronged fork, and never sowing any crop, or suffering any weed upon them. This feeding the roots with good nourishment will secure them from blights, for we fancy these are in the air; they are in reality generally in the tree. The blossoms may be defended as we have directed for the apricots; and the fruit must be thinned from time to time in the same manner: only in this, regard is to be had to the kind, for the small peaches may be left somewhat closer than the large. The large late peaches should never be suffered to stand nearer than at four inches clear distance from one another; the others at three.

The nectarine is in all respects to be managed as the peach; and the other stone-fruit in the same manner as these, only requiring less care as they are hardier in their nature. I shall therefore give the management of the vine, a fruit peculiar in its nature, requiring a distinct management, and perhaps less understood than any.

CHAP. X.

Of the Vine.

WE are to consider the vine in two lights, as a wall-tree fruit for eating at the table, and as a vineyard-shrub for wine. The propagation is to be the same for both services; only the management afterwards is different. The soil must be poor and dry. Brickbats, or the chipings of free-stone, must be dug in among it for this purpose; and the place must be exposed to the sun.

The vine is to be raised from cuttings: these must be taken from good shoots of the last year's growth. Cut them off with a knot of the wood of the year before; and let them be cut off at six inches length above that knot. Plant these at eight feet distance, under a south-wall, burying the cutting so deep, that the uppermost bud is just at the level of the ground.

When they begin to grow, train up the main shoot strait to the wall, nailing it as it grows in length, and rub off all others in the bud.

The latter end of March is the best time for planting these cuttings; and they will

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shoot up to a great length during summer in the beginning of October they must be pruned with a free hand, cut them off so low as to leave only two eyes to each. The next spring draw up some of the mould about the stems, covering them up nearly to the lowest eye or bud. When they shoot, rub off all except those shoots which proceed from the two buds, nail those to the wall, and about the twenty-fifth of July, pinch off their ends, to stop their farther growth: then in October, when the leaves are fallen, prune these new shoots, leaving two eyes or three on each, according to their strength; and cutting away the rest of the length. The next year rub off all shoots except those from the buds just named: nail the branches horizontally to the wall, to give room to the new shoots; and thus proceed through that season, only if any have fruit on them, let the branch run till the beginning of October, and then pinch off the end.

In this manner the vine is brought with strength to its time of bearing. Then prune constantly at these usual seasons, always remembering that the vine bears only from the wood of the last year. At the winter pruning the shoots must be shortened to four binds each. About the eighth of May

May rub away all weak shoots, leaving only those from the proper buds, and only one from each of those if more should offer. About the twentieth of May the branches must be nailed to the wall: in the middle of June pinch off the end of the branches that have fruit on them; and three weeks after pinch off the ends of those which are to bear next year. Thus let them stand till the fruit is ripe; when that is gathered, prune the vines, and thus their management is compleated for every succeeding year; it is only a repetition of the labour of the last.

Standard-vines are to be raised just as the wall-kind. They are to stand in rows in the open ground at the same distance as those by walls, and these rows should be four yards and a half asunder. They are to be pruned and managed in all respects exactly as those at the walls; only they must be tied up to very strong and firm stakes, as they have not that support.

As to the choice of the kinds of grapes, a great deal depends upon their time of ripening, for the late grapes never ripen here except in remarkably fine seasons. The black sweet water is an excellent kind, and comes to perfection in August; the royal muscadine and liquor grape ripen early

early in September; the Frontignac grape ripens in the middle of September; and these, with the marillon and black cluster, are the kinds most worthy to be raised with us.

To this general management of fruit-trees, we shall add a very singular method of propagating them, which was first proposed by Agricola, and, after a long neglect, has been lately revived under the direction of Dr. Hill, by a very excellent gardener, Mr. Barnes of Elsham. We shall give his experiments in his own words, and add occasionally those confirmations of them, which have been obtained by the experience of the last year.

The difficulty of propagating some shrubs in the common way, and the small increase that can be made from others by all the usual methods, brought it into my thoughts, says Mr. Barnes, to try whether some expeditious manner could not be invented of raising a large number.

Every nurseryman will be glad to know this: for if he can, when he has got a new shrub, raise twenty or thirty instead of three or four, it will be a great increase for his profit: and in the same way, a gentleman, when such a thing falls into his hands,

hands will be better pleased to supply all his friends at once, than a few at a time, and not oblige all under the compass of many years. I thought the thing might be done, and that made me resolve not to be disheartened at one or two trials: and my honoured master has encouraged me by giving me opportunities to make the experiments, and looking upon their progress himself.

It is about a year since I began the trials; and between that time and this, I have made them various ways upon four-and-twenty sorts of trees and shrubs of the fruit and flowering kinds; not trusting to one or two samples of each, but using several dozen of every kind, and trying them in all the different conditions of culture, according to their nature, from the stove to the open air. By these means the experiments amounted to many hundreds; and as I kept a constant journal of them all, which I have here faithfully transmitted to the publick, every one will see how far each method succeeded, and which deserves the preference.

C H A P. XI.

Of Propagation by the Bud.

THE propagation of trees by layers and cuttings, shews, that if a piece of any kind be planted in the ground in such manner that it takes root below, the upper part will soon furnish all the rest, and become a perfect tree. If roots can be thus obtained, the rest follows in the course of nature. But this is not universal; for some trees will not take root in either of these ways: and if they would, still the number is but small that can be obtained by them, because it is but a certain part of the branches a tree can spare for that purpose.

On examining the cuttings which have failed, I have always found that the mischance happened by the rotting of that part of the cutting which was expected to send forth the roots; for the danger is where it had been fresh cut, and has no bark to cover it. I thought it natural, that if a method were used to keep that part from decay, all those cuttings would grow, which we usually see fail: and communicating

cating my thoughts to a gentleman of knowledge, he not only confirmed my opinion by his own, but gave me a receipt for preserving the ends of cuttings from rotting: and desired me to try it afterwards upon smaller pieces than such as are commonly used; and upon single buds.

Every leaf upon the branch of a tree or shrub, has usually a young bud in its bosom; and it is certain each of these buds has in it the rudiment of a tree of the same kind: therefore it appeared reasonable to think, that every branch might afford as many new plants as there were leaves upon it; provided it were cut into so many pieces, and this same dressing could prevent the raw ends of each piece from decaying. The advantage of such a practice appeared very plainly, for it must give many plants for one, and the thing seemed so agreeable to reason, that I resolved to try it.

Many mixtures of resinous substances have been proposed on this head, under the names of cements and vegetable mummies, by Agricola and others; but the very best, upon careful and repeated experience, I have found to be that just named: it is made thus.

Melt together, in a large earthen pip-
ken,

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ken, two pound and a half of common *pitch*, and half a pound of *turpentine*. When they are melted, put in three quarters of an ounce of powder of *aloes*; stir them all together; and then set the matter on fire; when it has flamed a moment, cover it up close, and it will go out: then melt it well, and fire it again in the same manner. This must be done three times: it must be in the open air, for it would fire a house; and there must be a cover for the pipkin ready. After it has burnt the last time, melt it again, and put in three ounces of yellow wax shred very thin, and six drams of mastich in powder. Let it all melt together till it is perfectly well mixed; then strain it through a coarse cloth into a pan, and set it by to cool.

When this is to be used, a piece of it must be broke off, and set over a very gentle fire in a small pipkin: it must stand till it is just soft enough to spread upon the part of the cutting where it is wanted, but it must not be very hot. It is the quality of this dressing to keep out wet entirely. The part which is covered with it, will never decay while there is any principle of life in the rest; and this being secured, nature will do the business of growing: This I have found true in practice: and
by

by repeated trials, in more kinds than one, I have found that I could raise from any piece of a branch, as many good plants as there were leaves upon it.

November the third, 1757, I took off four dozen leaves of the common Laurel, with the bud entire in the bosom of each leaf; and every thing being in readiness, I cut the wounded part smooth, wiped it dry, and covered it with some of the dressing. I planted them in four pretty large pots, one dozen in each. The mould in these pots was made extremely fine; and I planted them by making very small openings, and letting in the base of the leaf just so far that the top of the bud might not be wholly excluded from the benefit of the air. I gathered the fine mould carefully about each bud, and pressed it every way close, to keep the bud in its upright position, and prevent the air from coming too easily to the part whence the growth of fibres was to be expected. This was the management of the buds in all the pots.

One pot I set up to the rim in garden-mould under a warm south-wall; another I set in the same manner, but without that shelter; the third I set in the green-house, and the fourth in the stove. The intent of these different places, was to see what effect

effect such variation would take in the growth; the stove naturally inclining all things to shoot sooner.

I gave every one of them the same care and attendance that it was natural to allow to young plants, and no other. They had waterings in the common course, and those in the open air were sheltered by pease-straw in the severity of the winter.

I examined them January the fourth. Every bud in the pot which was in the stove had formed a good plant two inches high, and with sufficient roots.

Those in the open air were alive, but had made small progress. I examined these last again April the 12th, and almost all of them had made shoots, and had got good root, and were in a fair growing condition.

These plants require only the common care afterwards. They are to be removed into a nursery-bed at seven inches high; and they will thus make, by a quick growth, so many handsome shrubs.

Thus I found that as many plants might be obtained as there were buds upon the branch. The experiment may be used to hardy trees of more value; and the benefit of it is very plain.

March 5, 1757, I took off a branch of

a white poplar, on which were a great many buds. I cut this into as many pieces as there were buds upon it, cutting the branch through at equal distances between every two buds. I thus had a great many pieces of it, each about an inch in length, with the two ends raw, and with a bud nearly in the middle between them. I smoothed the wounded ends of these, and having some of the dressing ready melted, I wiped them very dry, and spread it all over the cut part of each extremity, leaving the rest of the piece, which was covered with the bark, naked. I planted them in pots in the same manner as the buds of laurel.

April 29, I examined these, and found they had produced so many excellent and healthy plants; every plant was upright, strait, well looked, and three or four inches high; and they had all very good roots. These experiments have been repeated near London with perfect success.

It is easy to see how this experiment may be extended; and perhaps there are very few hardy shrubs which will not succeed happily by it. The laws of vegetation are the same, whether the plant come from an English ditch-side, or the edge of an American lake; from the hills of one
of

of these countries, or the mountains of the other: nor is there any reason to suppose those from warmer climates will refuse this course of propagation in the stoves wherein we keep them.

If this prove true upon experience, which I have happily found in some late instances, here is a method of increase which may be extended to all trees and shrubs that have buds; and we shall be able to raise much greater numbers, and with much more ease, than by any way that is yet known. It became me to try the experiment itself upon the easiest subjects, and such as were most likely to shew its success: for the enquiry was, whether this could be brought about in nature. Others may assist in the extending the experiments to more kinds: 'tis certain the principles of vegetation allow of it.

At the same time that I prepared these buds of the poplar just named, with the parts of the entire branch, I took off some others with only so much of the wood as was sufficient to keep them entire; not cutting the branch through, but only taking the buds from the side of it with a small piece of the bark and wood. I smoothed these parts, wiped them dry, covered them with the dressing, and planted them in

in pots, in the same manner, and with the same care as the others. They had all the same advantages, but the success was not equal. Some of them made very good plants, but others failed: nor were the plants produced from those which succeeded, nearly so fine as those from the others.

From this observation, I lay it down as a rule, so far as these experiments can support a general maxim, that when buds are to be planted, it is best to allow them the whole thickness of the branch, however small the piece may be.

I laid these pieces horizontally, with the bud uppermost; and the success was as I have mentioned: it may be worth trying what would be the effect with the pieces planted perpendicular or obliquely, to give the bud a different direction from what it had in my pieces.

March 10, 1757, I took off some healthy branches of the common willow and the white willow: part of these I cut into lengths as the poplar, with one bud in the center of each piece; and from the other part I cut out the buds with a piece of the wood to each. I wiped the wounded parts of both dry, covered them with the dressing, and planted them in the same manner as the poplar in all respects.

The intent of this was to confirm the former experiment by other instances; and as the whole point was to try whether this power was or was not in nature, I again chose subjects the most likely to proceed.

This experiment answered exactly as the former: all the buds which had pieces of the entire branches grew, and most of the others. It appeared plainly, that this power of producing trees and shrubs from short pieces of their branches, in each of which there is a bud, is not repugnant to nature, nor limited to one kind: and this shewed farther, that the observation made in the other instance respecting the manner of the operation is true, namely, that the way to succeed best, is not to cut the buds out of the branches, but to cut through the branches, and allow each an entire piece, though it be ever so short.

These were the experiments I made in the last autumn, and the present spring, in the propagation of trees by buds; and I invite and request all gardeners to join with me in prosecuting these trials upon scarce and otherwise valuable kinds.

Altho' this practice be new, it is founded in the most plain manner on reason and the nature of things. There is no more wonder that a bud should produce an entire plant, than that a seed should grow.
Each

Each of these contains the rudiment of an entire plant of its kind, and there requires only a proper care in the culture to set it to growing. We do not wonder that the little lumps upon the stalks of the *Dentaria*, the *White Saxefrage*, or the *Scarlet Lilly*, should grow when put into the ground; and there is the same reason that these buds should, for they contain, in the very same manner, the originals of future perfect plants.

We do not enough regard the uniformity of nature; and it is thence our wonder rises. But there is yet another instance in the course of the gardener's profession, which agrees more exactly with the growth of the bud, than either the seed, or the little lump upon the stalk; this is the common class of bulbous roots. In all these what is called the bulb, is not a root, but a rudiment of a plant surrounded with a great many coats, or a thick substance, by way of defence from the injuries of the air. The roots of the plant are those fibres which grow from its base. The bulb is formed every year, and a new one always succeeds that which had furnished the stalk and flower of the preceding season. A bulb is an embryo plant, covered with films, and fleshy matter, formed under ground upon the base of the root of a

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plant

plant; a bud is an embryo shrub or tree, covered with films, and scales in the same manner, and formed in the free air upon the branches of the shrub. They are the very same in their nature and construction, and in the end they are to serve. We see the bulb shoot up a perfect plant without surprize, why then should we wonder that the bud will have the same success? Custom has made the one familiar to us; the other at present is new and scarce: there is no other difference.

Nothing could appear so strange as the producing plants from cuttings, when Lauremberg first proposed it to the world; yet what is now more familiar? The growth of cuttings is of the same nature with this which is here proposed; and there is reason to believe, that the propagation by single buds will soon be as common: and probably with proper care it will succeed as well in all other trees and shrubs which have buds of a proper kind, as in those here instanced. Many trees and shrubs are destitute of buds entirely; indeed those from the hotter countries almost without exception; and in others there are some buds which are destined to the production of some one part of the tree alone, not of the whole: therefore they will not answer the purpose. The Alaternus and the Oleander,

ander, the common Syringa, and the Tamarisk, the Savin and the Sensitive Plant, are instances, among many others, of trees and shrubs which have no buds at all, and therefore do not come within this course of propagation. The Alder has buds for leaves, which contain no rudiments of flowers, and therefore perfect plants could not be produced from them. In the Poplar there are distinct buds for the flowers, and others for the leaves; therefore, if the flower buds were taken, no success could be expected. The Hazel has its buds, containing leaves and female flowers; the Pine and Fir male flowers and leaves together: how these buds would succeed, is a subject of great curiosity, and is worthy trial: but in general, the bud of a tree contains the rudiment of the perfect tree, and therefore a perfect tree may be produced from it.

This is the usual condition of buds; and therefore, in the generality of kinds, trees may be produced by this practice with great ease, and in great abundance. There is also, as I think, another very considerable advantage from this method, though the limited number of experiments I have named, does not permit me to affirm it with all the certainty of the other facts. This is, that the trees produced from

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buds .

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buds, will naturally be handsomer and more vigorous than those raised any other way, except from seeds: for in layers there is a great interruption of the course of the juices; and in cuttings it is uncertain whence the principal of growth will begin to act, so that nature is disturbed in her progress, and the juices receive a check in their current either of those ways; the effect of which in nature, we see plainly in the growth of the Pine-apple, and many such instances: whereas, when the bud is planted, the succeeding tree rises strait from its natural place, and there is no turn given to the juices, nor any check in the growing. From the time the rudiment begins to grow, it continues growing; and while it lies in the bud, it is as much at rest as the plant in the seed, till nature sets it to shooting. Art does the same in this process, and the effect is no way different; the tree grows just as the shoot would have grown on the branch. So many buds as there are on a tree, so many perfect trees of the same kind may be produced, if the Gardener takes care of them, for each is a young tree, and no other.

At a certain distance from the root, the rudiments of leaves, instead of forming separate leaves, like those below, coalesce in
their

their origin, and form a cup; and at the same time, and by the same power, whatsoever it is (for it is hidden from us in itself, though visible in the effects) the rind and pith of the stalk, instead of continuing the growth in that form for the farther increase of the branch, break out into broad thin coloured parts and thready substances, and the rest of the parts of fructification: a flower is formed, and seeds follow; that is, the plant ceases to grow in height and length of branches, for nature has given in that respect a certain law to all; and where its parts cease to extend themselves in length, they terminate in the rudiment of a new plant, called a seed.

This is the course of natural vegetation. Now art taking its place, produces from the ground that shoot, by planting the bud, which in the common course of things would have been sent from the ends of the branches. It would then have produced flowers and seeds when it had grown to a very small length in this state, because the height of the stem, and the length of the branch whereon it grew, would have placed it at a due distance from the root: but when it is removed from this situation, and raised by planting the bud immediately in the ground, instead of forming only a short branch, it

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produces an entire tree, because the rudiments of leaves will never coalesce into a cup, nor will the rind and pith form flowers and seed-vessels until the allotted distance from the root is once obtained.

Linnaeus, who adopts from Loeffling this doctrine of the state of buds, says, he will give a great addition to the science, who shall say what it is that influences the extremities of the plant to burst out into flowers, and to form seeds. If I may offer my humble opinion, it is this: Nature has allotted to every plant, as to every animal, a certain growth or stature which it should not exceed; and the cause of difference in that stature in various plants she placed in their roots.

Every root, I imagine, has so much power as is necessary to carry up a plant to a certain height: then it ceases, and therefore there ends the immediate growth of the plant. When the branch can extend no farther, its parts all terminate; not abruptly, for that is not the course of nature in any thing, but each part, according to its kind, terminates in some one of the organs of the flower, and the result of all is a seed; which being put into the ground, will again grow and extend itself, because it gets a new root.

The plant can grow no higher, because
its

its root can furnish no more force for the ascent of sap; but the termination of the parts is by a seed, that is, a rudiment, which must be put into the ground, and will then get new root, and therefore grow again.

Art, and the practices of the gardener, may interrupt and disturb nature in these operations, and produce vegetable monsters; but this appears to be her regular course: and thus it is that a bud, which if it had opened on the tree, would have produced only a short flowering branch, will, like the seed when planted in the ground, grow to the height of the original tree: for the power of the root it gives, is sufficient for that purpose.

A root is required for this, because only the power of that organ can extend and increase the parts; but nothing more is wanting; for roots, like the polypes and certain worms, have power even when cut to pieces to reproduce the several parts.

From these considerations may be understood all that appears wonderful in the production of plants from the bud, and consequently from their other parts: and we shall see that what appears to be production or propagation, from the parts in general, is the same thing under another form: and that the raising plants by cuttings,

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tings, is another way of operating by the bud, though not so regularly. If this be proved, it is certain that the taking a bud itself will be preferable to the setting it loaded with a part of a branch. The rudiment of a root will strike more readily, when the bud wherein it is contained is placed immediately in the ground; and the course of the sap will be plainer, shorter, and easier, than when it is to run through a long though useless branch. This is in some degree reducing the gardener's art to its principles; and we shall always succeed the better, the more perfectly these are understood.

If it be true, according to these remarks, that a bud is nearly of the nature of a seed, there can be no doubt of its succeeding the better, the nearer we bring its management to the seed-culture. Indeed there is in nature something like an instance of it in the plant *bistort*. This produces bulbs upon the stalk, which are a kind of buds; and these usually fall off, and take root: but sometimes they will shoot upon the stalk. In the first case they produce perfect plants of the same kind, but in the latter always poor, irregular, and imperfect ones.

C H A P. XII.

*Of the Dressing of Cuttings with this
Cement.*

HAVING seen the good effect of this dressing upon the wounded part of these pieces of branches, that it certainly prevented their rotting in the ground, and by that means gave nature time to operate in the upper part of the branch; I resolved to try its effect upon some cutting of those tender exoticks, which are found commonly to fail. It appeared to me, that the only cause of this, was the rotting of the lower part of the cutting; and consequently, that if this dressing could prevent that, it would secure the growth of the shoot.

Mr. Miller, in his *Gardener's Dictionary*, says, "some have asserted the coffee-tree would grow from cuttings; but that in all the different trials he had made, he never could obtain one plant that way." No body will doubt this author's experience, or that he knew how to manage his cuttings perfectly well: for this reason I fixed upon the coffee-tree for the kind I should first try in my new way.

November the third, 1757, I took off
some

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some cuttings of the coffee-tree in the usual way ; I wiped the wounded part very dry, and dressed it with some of the cement just melted so as to run. I planted these cuttings in pots in the common way, and set the pots up to the rim in the bark-bed in the stove.

As this was a point of importance, as well as curiosity, I did not think it just to risk the whole upon one trial ; therefore,

November the 28th, I took off some more cuttings from a coffee-tree, dressed them with the same care, and planted them in the same manner in pots, plunging them into the bark-bed in the stove.

April 20, I examined these cuttings, and found they were in a very healthy condition.

May 16, I again examined them, and they had shot six inches in height, and had got very good roots.

On the 12th of December I took off some slips of the coffee-tree, wiped the wounded part, and dressed them with cement. I planted these in the same manner as the cuttings, and gave them the same care ; they succeeded as well, but not at all better than the cuttings. They all furnished very good and healthy plants.

From these experiments it appears, that those tender and precious shrubs and trees,
which

which will not grow in the common way from cuttings, may be brought to succeed in this manner: and this is a very considerable use of the dressing here described. It is a nice and difficult article to hit the right ingredients and just proportions: many have failed in various operations, who used such mixtures as were ill made up; but ours will certainly answer this and the former purposes, as well as many others, to be named hereafter.

That this effect of the dressing upon the cuttings of tender plants, might be confirmed or refuted by more instances,

April 17, I took off some cuttings of the orange and lemon trees in the common method used in cutting: I wiped the raw ends very dry, and dressed them with the cement. I planted these in pots, and plunged them in the bark-bed in the stove.

May 28, I examined them, and found they had begun to shoot.

June 20, they had shot three or four inches, and got very good roots.

April 6, to confirm this practice by another instance, I took off some cuttings of the Double Oleander: I wiped the wounded parts, covered them carefully with the dressing, planted them in pots, and plunged them in the bark-bed in the stove.

May 29, I examined these; they had all
done

done very well; every cutting had shot six inches, and they had all got very good roots.

April 12, 1758, I took off some cuttings of the coffee-tree, wiped the raw part dry, and covered it carefully with the dressing; I then planted them in pots, and plunged them in the bark-bed in the stove.

May 30, I examined the pots; I found every one of the cuttings had formed a good and thriving plant: they had shot six inches in length, and had got good roots.

These experiments shew, that the dressing agrees equally well with the generality of plants, preserving the lower part from decay, and by that means giving nature an uninterrupted course for the nourishment of the shoot above, and time to send out roots from the part below in the same manner; for when nourishment is received, and the vegetative principle is unimpaired, the shooting of roots from the part below the surface, is as natural as the sending out of branches from above.

It is plain this use of the dressing may be of great benefit, since it will cause many plants to succeed by cuttings, which would not otherwise do that way at all; and will make others succeed freely and generally, which without this assistance would answer but seldom, and at the best but poorly. The preventing

preventing the decay of the bottom of the cutting, is the great article; for when that rots, it destroys the whole. The decay of this is like a mortification in animal bodies; as soon as it has seized the part, it spreads and infects, and destroys all.

This decay in cuttings, is occasioned by the moisture of the ground which affects the raw parts; but if that be guarded from the mischief, nature does all the rest. The Gardener need only prevent the decay of the cutting, the growth will follow without his assistance.

But though the effect of the dressing for this purpose is general, it is not universal: though it will answer with most plants, it will not do with all. This I have found by the like experiments, and it becomes me to acknowledge it: physicians have done the world as much service by giving accounts of diseases wherein remedies failed, as of those in which they succeeded; and I would not serve this cause, even by silence, where it failed.

April 19, I tried it on the sensitive plant. I took off some cuttings with great caution, being sensible how difficult it would be to make them succeed: the pots were ready with excellent mould, and the dressing on the fire: I wiped the raw ends dry, covered them carefully with the cement, and
planting

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planting them with all possible care, plunged the pots into the bark-bed in the stove. They all died.

Willing to make another trial, that I might be sure wherein this method failed, as well as where it succeeded, on the 28th of May I dressed another parcel of cuttings of the sensitive plant in the same manner, using, if possible, more caution than at first, that they might have every possible advantage. July 29, I examined the pots, and these were also all entirely dead.

In experiments on raising the sensitive plant by cuttings, therefore this method fails; but it is the only plant on which I have hitherto found it ineffectual.

It is plain therefore, that the use of this method will be extremely beneficial, not only for the raising plants from buds, but also from cuttings. That strange writer Agricola, who first proposed this kind of propagation, has disgraced his work by many falsehoods; and for that reason, what was true and useful in it, was long neglected; neither had he the secret of a good cement, nor the great advantages of stoves: so that while, on the one hand, he has ventured to assert much more than is true, on the other he had not opportunities of knowing all that could be done by it.

That

That author has asserted that trees may be produced from leaves. He says, the tender part between the ribs decays, and the fibres grow up into branches: he has even given relations, and figures of orange and lemon trees, and many others, which he says he raised in this manner. Though there was little probability of truth in these accounts, yet being upon the subject, I resolved to give this also a fair trial, using on some leaves of each kind the cement he directs, and on others my own. The result will be found in the following chapter.

C H A P XIII.

Experiments on Leaves.

NOVEMBER 3, 1757, I picked four dozen healthy leaves of the common laurel: I took them carefully from the tree with no buds joining to them: I smoothed the end when they were pulled off with a sharp knife, wiped it dry, covered it with the dressing; and thus preparing them all, I planted them in four middle-sized garden-pots, one dozen in each. Two of these were exposed to the air, the one under a south wall, the other without that shelter, and both set up to the rim in mould; a third I set in the green house, and the fourth pot I

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plunged

plunged in the bark-bed in the stove. This last place was chosen to promote the shooting of the fibres, nothing having so great power for that purpose.

That the determination of this point might not rest upon one set of experiments made at only one season, April 12. 1758, I took off two dozen more leaves of laurel with the same precaution: I dressed them in the same manner, and planted them in a shady border.

May 29, 1758, I took off a third parcel of laurel leaves, and dressing them as the others, planted them also in a shady border.

At the same time I examined those of the November planting, and found them all dead in all situations.

April 19, I took off some healthy leaves of orange and lemon trees; cut the raw ends smooth, wiped them dry, covered them with the cement, and planted them with all possible care in pots of good mould, and plunged them in the bark-bed in the stove.

From time to time I gave these all possible advantages for promoting their growth.

May 29, I examined them; they were all dead, without any attempt to shoot out fibres.

May 30, I selected another parcel, prepared and planted them with the same care,
and

and gave them all the possible advantages for growth.

July 29, I examined them, and found them all dead; no one having made any attempt to shoot out any fibres.

That this might not rest upon one species in the stove, I determined to try also the coffee tree.

April 27, I took off some very fine and fresh leaves from a healthy coffee tree, smoothed the raw ends, covered them with cement, and planted them in pots. I set these in the bark-bed in the stove, gave them all the same advantages with the others, and on searching them, May 30, I found them all dead.

During the course of this experiment, on the 16th of May I took off another parcel of the coffee-leaves, dressed them with the same care, and planted them in the same manner.

June 27, I examined them, and found them all dead.

All the time the laurel leaves of the several spring-plantations remained in the ground; and I bestowed on them the common care, being determined to omit nothing that might give fair play to the experiment; nor to take up any leaf till it should be evidently dead.

August 26, 1758, I examined carefully
C c 2 those

those leaves which had been planted in April, May, and June, removing the mould a little from them. It is certain some of them have shot a few fibres from the lower part of the footstalk. What will be the result, is impossible to say; the prospect of success is very little, but the question is not fully decided.

C H A P. XIV.

Of Propagation of Trees by Parts of the Roots.

FROM the success of the method of propagation by small pieces of the branches of trees, it is natural to conceive that smaller or larger pieces of the roots will answer the purpose; and the same author who has treated of the last experiment, mixing truth with falsehood, has named also this.

Reason is very fairly on the side of the experiment. We see that roots, wherever they reach the surface of the ground, shoot up into young trees; and we find, by manifold experience and observation, that the difference between roots and branches, is little more in nature, than that the one are buried under ground, the other kept above it. This new method of propagation depends upon one principle, namely, that the rudiments

rudiments of new plants are lodged in all parts of the old, and are ready to grow from them to perfection, whenever they have proper advantages. Therefore it should appear to reason, that if a piece of a root can be kept from decaying in the earth, it will produce one or more new plants. This I proposed to try by the following experiment.

November 3, 1757, I raised carefully by opening the ground, a large horizontal root of the Willow-leaved Buckthorn. I trimmed off all the side shoots; and cutting the two ends smooth, wiped them perfectly dry, and covered them with the dressing all over the raw parts; not only the two ends, but the several places also from whence I had cut the side shoots and large fibres. I opened a trench in a bed in the nursery long enough to receive the whole piece, and laid it in horizontally, and covered it an inch deep with mould, not raising a ridge over it, but keeping the place on a level with the rest of the bed.

April 12, I examined this ground, and found a great many shoots rising up at different distances from the whole length of the root.

April 30, many of the shoots have got six inches high, and all appear very vigorous.

May 20, several of the shoots are a foot long, and promise to make very strong and fine plants.

June 27, I took up the entire root, and cut it into as many pieces as there were good shoots: thus every young plant had a piece of the large root for its base, and a multitude of small fibres newly shot.

I wiped the two raw ends of every piece; covered them carefully with the dressing, and just trimmed the extremities of the new fibres.

I planted them in a shady border in the nursery, and occasionally watered them. I have so many fine plants. These seemed in danger at the first removal, and I believe it would be better hereafter, when plants are thus raised, to let them stand till the next spring before they are moved.

To try whether the roots of trees would not produce new shoots as well when cut to pieces, as in the entire length,

November 3, the same day with the first experiment, I took up another root of the same shrub, and cut it into pieces of two or three inches in length; I smoothed the raw ends of each piece, took off the side shoots, and covered the two raw ends, and all the small wounds made by taking off the fibres, with the dressing. I planted them, at the same time, with the entire root in the nursery, and gave them the same care. The success was the same.

June the 28th, they had all shot up one
or

or more new plants. I took them up, took off all but the best shoot, and planted them in the nursery, where they are now growing. That this experiment might not rest upon one trial, or seem appropriated only to one plant; on the same day, November 3, 1757, I took up two roots of a Virginian acacia, which was in good health, and could spare them without danger. One of these I dressed entire, the other I cut into pieces of two or three inches long; and covering all the wounds with the cement, I planted them in the same manner as the others, in an open part of the nursery, laying them lengthwise in a shallow trench, and covering them an inch with mould.

In frosty weather I threw a little peas-haulm over the ground.

April 24, I examined the ground, and found young plants rising from almost all the small pieces of the root, and a great many from the entire one.

May 20, I had from these roots a great many fine plants of a foot or more in height.

June 27, I took up the large root, and cut it into as many pieces as there were good plants: I wiped these dry at the ends, and covering them with cement, planted them out in the nursery. They succeed very well; but required care at first. It will be best to

let these plants all stand till the next spring before they are removed.

To try whether the root would succeed best naked, or with the fibres about it, the same day, November 3, 1757, I planted a root of the Sallow thorn, and another of the Virginian acacia with their fibres. These are no hindrance, and they appear to me to be an advantage. The great point is securing the root from decaying at the two wounded ends; for if that be prevented perfectly, nature will do all the rest,

The pressing down the mould about the root when first planted, is a very necessary caution; and in the course of the experiment, the place must be kept moist with due waterings. According to the more or less hardy nature of the shrub, the root will require more or less shelter and defence in winter; and with this management there is no doubt of perfect success.

At the same time that I made these experiments on the roots of European and American ornamental shrubs, I was determined to try it also on fruit-trees.

November 3, 1757, I took up two long pieces of the spreading roots of an apple-tree, beginning at some distance from the stem; and opening the ground all along, that I might get up the extreme part of the roots, with their small divisions. One of these I
cut

cut into lengths, and the other I left entire, not cutting off the side shoots or fibres from either. I smoothed the wounded ends with a sharp knife, and covered them perfectly with the dressing or cement just made warm.

I opened a trench in a bed of the nursery, and laid them in, covering them an inch over the upper part, with mould pressed well down in every part about them. I allowed these the same care as in the former instances, and they succeeded as well.

April 7, 1758, I examined the ground; several young plants appeared both from the entire roots and the pieces.

May 20, 1758, many of the new plants had shot a foot high, and were very vigorous and promising.

July 27, I took up the entire root, cut it into as many pieces as there were good plants; and wiping their raw ends dry, covered them with cement, and planted them out in the nursery.

They prove very good plants.

The pieces of the root planted at the same time succeeded also very well; and having been transplanted into the nursery, are now good plants.

At the same time November 3, 1757, I took up two handsome pieces of the root of a pear-tree, and managed them in the same manner exactly, as those of the apple-tree
in

in the former instance. They were planted in the same manner, and had the same success. That which had been laid in the ground entire, I cut in July into as many pieces as there were good plants upon it, and the others I trimmed of all shoots but one to each. The wounded parts I wiped dry, and covered with cement, and planting them in the nursery with the common care, they are all now thriving plants.

That this experiment, which may be useful to Nurserymen, and all who desire to raise a great number of plants, might not rest upon so few kinds, I extended it at the same time to several other trees and shrubs.

November 4, 1757, I cut off some roots of the elm, the oak, the cherry, the plumb-tree, the common white-thorn, and the platanus: some of these I planted in the whole lengths, and others in each kind I cut into short pieces, covering with cement the wounded parts, and planting them in the same manner as those before mentioned, and the success was also the same.

April 30, I examined the ground, and found they had all sent up vigorous shoots.

May 26, most of them had shot a foot or more in length, and were very promising plants. These I treated in the same manner as the preceding; and as many of them as I chose to preserve, are now fine plants.

I am of opinion, however, in regard of these

these as well as the others, that if they had been suffered to remain till next spring before they were removed, they would have done better, and with less trouble.

C H A P. XV.

Of Propagation by large Branches.

THE same kind of reasoning, which led us to believe that the roots, or pieces of roots, would raise young plants, being very naturally extended to the branches, I was determined to try what would be the success upon experience. The difference between roots and branches being very little, the same method may be used for one as for the other.

November 12, 1757, I took off a branch of an apple-tree, and rubbed away so many of the buds, as to leave them only at three inches distance, or thereabout, and as much as could be all on one side of the branch. I smoothed the end, wiped it dry, and covered it with the cement, as also the places where the buds had been rubbed off. Thus prepared, I laid the branch in a trench opened in the nursery, in a bed of good mould, and covered it an inch, pressing the mould very well about it.

April 27, 1758, I examined the ground,
and

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and found a great many very fine plants coming up.

May 26, they had shot six or eight inches, and got good roots.

June the 12th, the plants being all very vigorous, I took up the branch, cut it into as many lengths as there were plants, covered both ends with cement, and planted these in a shady bed in the nursery.

June 30, I examined the plants, by removing a little of the mould, and found they had got fresh root. They succeed very well; but probably would have done yet better, if left in the ground with the entire branch till the succeeding spring.

At the same time that I began these last experiments on the apple-tree, I tried also the pear.

November 12, 1757, I cut off a handsome branch of a pear-tree, rubbed off a part of the buds, and smoothing the wounded end with a sharp knife, I covered it with the cement, as also the places where the buds were rubbed off. I planted this in the same manner as the other, and with the same success.

June 12, I took up the branch, cut it into as many lengths as there were good shoots, and planted them out in the nursery, cementing first the two wounded ends. They are all now living, and are thriving plants.

To

To extend this experiment to other kinds of shrubs and trees, I made choice of the fallow thorn, elm, and the Virginian acacia. The result was different; and I shall give it separately.

November 9, 1757, I cut off a branch of the fallow thorn, or sea buckthorn, rubbed off a part of the buds, smoothed the wounded end with a sharp knife, and covered that part, and the places where the buds had been, with melted cement. I planted this in a trench in the nursery, in a bed of good mould, as the others.

April 7, several very good plants appeared.

May 20, I cut the branch into several pieces, each having a good shoot; and covering the two wounded ends with cement, planted them in another bed. They are all now good and healthy plants.

April 20, 1758, I cut off in the same manner some branches of an Elm-tree, and planted them with the same caution in a shady border of the nursery.

June 29, I examined the ground: they had all taken root, and there were a great many good shoots from them.

November 15, 1757, I cut off a good branch of the Virginian acacia, smoothed off the wounded end, wiped it very dry, and covered it with melted cement. I planted
this

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this in the same manner, and with the same care as the other, covering the ground in frosts with peas-haulm, and removing it when milder.

April 30, I examined the ground: nothing was seen coming up; but on removing a little of the mould, the branch appeared to be alive.

June 2d, I examined it again: the branch was quite dead, and there had been no appearance of any shoot from it.

This method by the branches of trees, is but a different way of raising by the bud, but we see it is not universal; though it will succeed with the far greater part of plants. The gardener may understand by this, that when he would try a new method of any kind whatsoever, he should not limit his experiments to one sort of plants, nor be discouraged at their failing in one species. It is plain, that the same method may be successful in one instance, which fails in others.

As to the branches and pieces of branches laid horizontally in the ground, they will thus produce plants of a good kind; so will at any time pieces of them, cut to a proper length, secured from rotting in the wounded parts, and placed in an erect position.

February 6, 1758, I cut off some shoots of an apple-tree a foot long, and took a piece of the old wood with them; I smoothed the
raw

raw parts, covered them with cement, and planted them in a bed in the nursery, at six inches distance, leaving only an inch of the shoot above the ground. I gave them the common advantages of new planted things, and watered the bed at times.

May 27, I examined these; they had all succeeded perfectly well; they had taken good root, and shot about six inches in height.

March 7, 1758, I repeated the experiment upon some shoots of the pear-tree. I cut these off, in the same manner, at about a foot long, and took a piece of the old wood with each. I smoothed the ends, covered them with the cement, and planted them in the same manner in a bed in the nursery.

May 26, I examined them; they had all shot about six inches in length, and had got very good roots. They are now so many very fine plants.

That this experiment might not be limited to the fruit kinds, I chose the common elm for another instance.

February 6, 1758, I cut some shoots of the elm in the same manner, with a piece of the old wood to each: I smoothed the raw ends, and covered them with cement, and planted them exactly as the others, in a bed in the nursery.

May

May 27, I examined the ground, and found they had all shot five or six inches in height, and were stout and flourishing plants, having all good roots.

This tends to confirm the general doctrine upon which these experiments were all established; which is, that any part of a tree which can be preserved from rotting when in the ground, will send up a new plant of the same kind; and that the danger of decay is not in any of the parts covered with the bark, but only in those which have been new wounded. It appears that the cement or dressing here directed, will preserve those parts; and therefore that by its means trees and shrubs may be produced from all their parts.

I shall close this account, by a method not altogether of the same kind with these; but as it will succeed in several cases, where the common ways fail, it may not be unworthy of the notice of Gardeners.

C H A P. XVI.

A Way of raising Trees from the Root.

TO raise a new plant from the root of those kinds which will not take as layers, or grow from cuttings, I use this method: I lay open the earth over one of the
roots

roots of a thriving tree, of half an inch diameter, or more, according to the nature and growth of the tree: in small and tender trees, smaller roots will do. I raise this out of the ground, cutting it two-thirds through, and trim off all the side fibres for about six or eight inches of the root: then I dress all the wounded parts with the cement just warmed, and keep the wounded part of the root for about five inches length out of the ground, supporting it by a forked stick.

Thus it has the advantage of its own fibres, and of the general vegetation and growth of the tree, all the time that it is thus kept up above the ground. It has been said before, that the branches and roots of trees differ in nature no other way, than as the one are under ground, and the other in the open air; and therefore this part of a root being raised into the air, what grows from it will be of the nature of a branch or shoot, not of a root. The spring is the best season for doing this; and if due care be used, it will always succeed. There will be young shoots produced from the part that is in the air. These should stand till the next spring to be well established, and they may then be cut off, and will readily and certainly succeed.

I have raised in this manner plants of the

D d

double

double oleander, the cotton-tree, and of several other kinds, the most difficult to be raised by the usual methods of culture.

Thus have I laid down what experience has shewn me, upon frequent and repeated trials, relating to the methods proposed by others, and used in my own practice, for raising valuable trees in abundance, and in an expeditious method; and I hope my brother gardeners will find the advantage. They may indeed do much more; for tho' the experiments I have made amount to several hundreds, yet they have been limited to only a few species out of that almost infinite variety nature has thrown before us. These experiments may be easily repeated in these kinds, and new ones may be made upon the same principles. Perhaps also the few I have made unsuccessfully, may, in the hands of some others, be crowned with success, for nature is very various, and the event of experiments frequently depends upon little circumstances in particular cases which are not seen, and which tho' they have prevented it in one place, may not occur in another. Even the sensitive plant may perhaps rise from cemented cuttings under some other hand.

F I N I S.



